# Model Surface Water Drainage Statement

In order to provide the required information on surface water drainage from the proposed. The pro-forma is supported by the Defra/EA Guidance on Rainfall Runoff Management and can be completed using freely available tools including SuDS Tools. The pro-forma should be considered alongside other supporting SuDS Guidance, but focuses on ensuring flood risk is not made worse elsewhere. The SuDS solution must operate effectively for as long as the development exists. This pro-forma is based upon current industry standard practice.

**1. Site Details**

| | |
|---|---|
| **Site** | GREENFOOT LANE, BARNSLEY |
| **Address & post code or LPA reference** | SEE SITE SURVEY 2015/0548/INVALID |
| **Grid reference** | SEE SITE SURVEY |
| **Is the existing site developed or Greenfield?** | DEVELOPED<br>BUILDINGS DEMOLISHED. HARDSTANDINGS REMAIN |
| **Total Site Area served by drainage system (excluding open space) (Ha)*** | |
| **Topographical survey plan showing existing site layout, site levels and drainage system** | H&H SURVEYS DRAWING WA/325/SP |
| | |

* 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

| | Existing | Proposed | Difference (Proposed-Existing) | Notes for developers & Local Authorities |
|---|---|---|---|---|
| **Impermeable area (ha)** (areas to be shown on a plan) | | 375m² highway | | If the proposed amount of impermeable surface is greater, then runoff rates and volumes will increase. Section 6 must be filled in. If proposed impermeability is equal or less than existing, then section 6 can be skipped & section 7 filled in. |
| **Drainage Method** (infiltration/sewer/watercourse) | INFILTRATION | | 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. |

**PPG Paragraph 080**

## 3. Proposing to Discharge Surface Water via

| | Yes | No | Evidence that this is possible | Notes for developers & Local Authorities |
|---|---|---|---|---|
| **Existing and proposed micro-drainage calculations** | | ✓ | | **Please provide micro-drainage calculations of existing and proposed run-off rates and volumes in accordance with a recognised methodology or the results of a full infiltration test (see line below) if infiltration is proposed.** |
| **Infiltration** | ✓ | | SEE SECTION 7 OF SITE INVESTIGATION | e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed. |
| **To watercourse** | | ✓ | | e.g. Is there a watercourse nearby? Please provide details of any watercourse to which the site drains including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of the discharge point (as agreed with the LLFA and/or EA) |
| **To surface water sewer** | | ✓ | | Confirmation from sewer provider that sufficient capacity exists for this connection. |
| **Combination of above** | ✓ | | | e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above. |
| **Has the drainage proposal had regard to** | | | | Evidence must be provided to demonstrate that the proposed Sustainable |

| | | | | |
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| **the SuDS hierarchy?** | | | | Drainage proposal has had regard to the SuDS hierarchy. |
| **Layout plan showing where the sustainable drainage infrastructure will be located on site.** | | | PERMEABLE BLOCK PAVINGS TO HIGHWAY & PRIVATE DRIVES ETC | Please provide plan reference numbers showing the details of the site layout showing where the sustainable drainage infrastructure will be located on the site. If the development is to be constructed in phases this should be shown on a separate plan and confirmation should be provided that the sustainable drainage proposal for each phase can be constructed and can operate independently and is not reliant on any later phase of development. |

## Technical Standards S2 and S3

**4. Peak Discharge Rates** – This is the maximum flow rate at which surface 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 |
|---|---|---|---|---|
| **Greenfield QBAR** | | N/A | N/A | Mean annual Greenfield peak flow - QBAR is approx. 1 in 2 storm events. Use that figure in Section 7a. |
| **1 in 1** | | N/A | | 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. |
| **1 in 30** | | | | |
| **1in 100** | | | | |
| **1 in 100 plus climate change** | 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. |

## Technical Standards S4 to S9

**5. Calculate discharge volumes** –The total volume of water leaving the development site for a particular rainfall event. Introducing new impermeable surfaces increases surface water runoff and may increase flood risk outside the development.

| | Existing Volume ($m^3$) | Proposed Volume ($m^3$) | Difference ($m^3$) (Proposed-Existing) | Notes for developers & Local Authorities |
|---|---|---|---|---|
| **1 in 1** | | N/A | | Proposed discharge volumes (without mitigation) should be no greater than existing |

| | | | | |
|---|---|---|---|---|
| **1 in 30** | | | | volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in. |
| **1in 100** | | | | |
| **1 in 100 plus climate change** | | | | 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** – In order to minimise the negative impact on flood risk resulting from increased volumes runoff from the proposed development, storage must be provided.

| | | **Notes for developers & Local Authorities** |
|---|---|---|
| **Storage volume required to retain discharge rates as existing ($m^3$)** | N/A | Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing |
| **Where will the storage be provided on site?** | | |

**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 intention is to not discharge that volume into the watercourses so as not to increase flood risk elsewhere.

| | | | **Notes for developers & Local Authorities** |
|---|---|---|---|
| **Infiltration** | **State the Site's Geology/drift material overlaying)** | | Avoid infiltrating in made ground. |
| | **Does the site have a high ground water table?** Yes/No? | ~~N/A~~ | If yes, please provide details of the site's hydrology. |
| | **Is the site within a known Source Protection Zones (SPZ)? Yes/No?** | SEE S.I. | Infiltration rates are highly variable and refer to Environment Agency website to identify and source protection zones (SPZ) |
| | **Are infiltration rates suitable?** | REPORT | Infiltration rates should be no lower than $1x10^{-6}$ m/s. |
| | **Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.** | | 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. |

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| | **State the distance between a proposed infiltration device base and the ground water (GW) level** | | Need 1m (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible. |
| | **Were infiltration rates obtained by desk study or infiltration test?** | | Infiltration rates can be estimated from desk studies at most stages of the planning system if a back-up attenuation scheme is provided. |
| **Is infiltration feasible?** | **Yes/No?** | YES | If infiltration is not feasible how will the additional volume be stored?. The applicant should then consider the following options in the next section. |

### 7a. Storage requirements

Where infiltration is not possible, then the developer must confirm that either of the two options below will ne implemented for dealing with the amount of water that needs to be stored on site.

**Option 1 Simple** – Store both the additional volume and attenuation volume in order to make a final discharge from site at **QBAR**. 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.

| | | **Notes for developers & Local Authorities** |
|---|---|---|
| **Please confirm what option has been chosen and how much storage is required on site.** | N/A | The developer at this stage should understand the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved. |

### 8. Additional Consideration to comply with the Technical Standards and PPG

| | | **Notes for developers & Local Authorities** |
|---|---|---|
| **Which Drainage Systems measures have been used?** | SUDS | SUDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath |

| | | |
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| | | some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C697 or subsequent version (C753). |
| **How will exceedance events be catered on site without increasing flood risks (both on site and outside the development)?** | N/A | **Safely:** not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths |
| **How are rates being restricted?** | N/A | 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. |
| **Drainage during construction period** | N/A | Provide details of how drainage will be managed during the construction period including any necessary connections, impacts, diversions and erosion control. |
| **Key Drainage components / Features** | N/A | Which component if blocked (even partial) will lead to flooding? |

## Technical Standards S10 to S12

### 9. Management and Maintenance of SuDs

Details are required to be provided of the management and maintenance plan for the SUD, including for the individual plots in perpetuity.

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| **How is the entire drainage system to be maintained in perpetuity?** | T.B.A. | Clear details of the maintenance proposals of all elements of the proposed drainage system must be provided to show that all parts of SuDs are effective and robust.<br><br>Provide a management plan to describe the SUDS scheme and set out the management objectives for the site. It should consider how the<br><br>SuDs will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed.<br><br>— Specification notes that describe how work is to be undertaken and the materials to be used.<br><br>— A maintenance schedule describes what work is to be done and when it is to be done using frequency and performance |

| | | |
|---|---|---|
| | | requirements as appropriate.<br>— A site plan showing maintenance areas, control points and outfalls. Responsibility for the management and maintenance of each element of the SUDS scheme will also need to be detailed within the Management Plan .<br>Where open water is involved please provide a health and safety plan within the management plan. |
| **Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.** | BARNSLEY M.B.C.<br>PRIVATE OWNERS FOR DRIVEWAYS | 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. Please give details of each feature and how it will be managed in accordance with the details in the management plan. |
| **Please provide details demonstrating that any third party agreements required using land outside the application site have been secured.** | | |

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form Completed By... WHITE AGUS PARTNERSHIP.

Qualification of person responsible for signing off this pro-forma ROBERT AGUS M.I.C.A.T. A.C.I.O.B

Company WHITE AGUS PARTNERSHIP

On behalf of (Client's details) RICHFIELD DEVELOPMENTS Ltd

Date: 01/07/15