

Dumfries and Galloway Council

LOCAL DEVELOPMENT PLAN 2

Surface Water Drainage and Sustainable Drainage Systems (SuDS)

Supplementary Guidance - February 2020



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1 Introduction

1.1 The purpose of this Supplementary Guidance is not to set out detailed advice for the design of SuDS (Sustainable Drainage Systems) but is to provide a commentary to support the effective implementation of Dumfries and Galloway Council requirements and objectives for SuDS. These arise in the context of SuDS for roads, SuDS as part of flood risk management, SuDS under Building Standards and SuDS in planning. The first three of these are each recognised in this Supplementary Guidance, but its primary role is in support of Local Development Plan 2 (LDP2) Policy **IN8: Surface Water Drainage and SuDS**. In many cases it should be considered along with Policy IN7: Flooding and Development and its associated Supplementary Guidance.

1.2 Under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) it is a general requirement¹ for new developments with surface water drainage systems discharging to the water environment that such discharges will pass through SuDS. All reasonable steps must be taken to ensure protection of the water environment. The Controlled Activities Regulations (CAR) provide regulation under General Binding Rules (GBRs) 10 and 11 for SUDS.

It follows from the above requirement that for new development there should be consideration of SuDS in:

- the design and adoption of roads,
- the approval for Building Standards,
- and the achievement of planning objectives for
 - flood risk management,
 - amenity
 - biodiversity.

1.3 SuDS is an approach to surface water drainage consisting of a sequence of

¹ There are two exceptions to this requirement: (1) Where the development is only a single dwelling; and (2) Where the

water management practices and a sequence of facilities. These are both designed to drain surface water in a manner that mimics natural drainage using natural materials and processes and will provide a more sustainable approach than what had formerly been the conventional practice of routing run-off through a pipe to a watercourse. Whilst the physical designs for SuDS intend to mimic natural drainage and use natural materials and processes to provide more sustainable outcomes than former practice it is also part of the approach that the arrangements for long term care should be clear, robust, and secure over time. The implementation of SuDS is expected to help secure the objectives arising from the requirements of the Flood Risk Management (Scotland) Act 2009.

1.4 The national context for LDP2 Policy IN8: Surface Water Drainage and Sustainable Drainage Systems (SuDS) is provided in Scottish Planning Policy (SPP) and relevant Planning Advice Notes. The policy is relevant for planning because of the inter-related issues of flooding, water quality, and amenity. The overarching LDP2 approach for the consideration of amenity is set out in Policy OP1: Development Considerations. LDP2 Policy for the water environment in general is in NE11: Supporting the Water Environment.

1.5 The more specific LDP2 policy context for Policy IN8 is set by Policy IN7: Flooding and Development. This says “*For any site a Drainage Impact Assessment (DIA) may be required to ensure that surface water flows are properly taken into account in the development design. Consideration should be given to pluvial flows especially those which exceed the capacity of the proposed drainage systems. Design of Development must avoid flood risk from exceedance flows². (See also Policy for Surface Water Drainage and SuDS.)*”

discharge is directly to coastal waters (this does not include transitional waters).

² **Exceedance flows** are flows which exceed the capacity of any formal drainage system.

1.6 The flow of water on the surface of and within undeveloped land is a natural occurrence affecting water quality and the prospect of flooding. Development has the potential to change such flows and, depending on how surface water drainage is managed in new development and redevelopment, it could affect water quality and flood risk³, including from exceedance flows.

1.7 Managing flood risk and surface water is a material planning consideration for any development. The location, layout and design of new developments are the most critical factors for surface water arrangements from which both the probability and impacts in terms of water quantity⁴ and water quality⁵ arise.

1.8 Under the Sewerage (Scotland) Act 1968 surface water is “the run-off of rainwater from roofs and any paved ground surface within the curtilage of premises”. These are pluvial⁶ flows. Under the Water Environment and Water Services (Scotland) Act 2003, surface water is “inland water (other than groundwater), transitional water and coastal water.” This Supplementary Guidance is based on the wider and more recent understanding and also includes subsurface water in or running through a site.

2 The Policy

IN8: Surface Water Drainage and Sustainable Drainage Systems (SuDS)

³ The meaning of ‘**flood risk**’ is from SPP. It is ‘the combination of the probability of a flood and the potential adverse consequences, associated with a flood, for human health, the environment, cultural heritage and economic activity’.

⁴ **Water quantity** includes flood risk (Policy IN7) resulting from surface water arrangements of development.

⁵ **Water quality** (Policy NE11) includes consideration of pollution resulting from surface water

With the exception of single houses and those with direct discharges to coastal waters, Sustainable Drainage Systems (SuDS) will be a required part of all proposed development as a means of treating the surface water and managing flow rates and must form part of any planning permission in principle proposal.

Consideration of drainage issues is a planning requirement for every planning proposal. This consideration should be initiated as part of any preliminary site assessment and should progressively inform the generation of schemes as they develop. For any site a Drainage Impact Assessment (DIA) at the appropriate level may be required to ensure that surface water flows are properly taken into account in the development design.

Planning applications must include appropriate and proportionate details of the proposed SuDS to show how they will:

- ensure the system is designed to avoid flood risk from exceedance flows;*
- be accommodated within the proposed site⁷, and understood as an essential factor in determination of the overall capacity of any site;*
- be based on a unified approach to cover surface water drainage from on-site roads and from the remainder of the site;*
- contribute positively to the biodiversity, general amenity and water quality of the area of the proposal;*
- include a coordinated approach between new developments that are adjacent to one another;*

arrangements of development.

⁶ **Pluvial flows** are flows of water that are a result of rainfall. Pluvial flooding is urban or rural flooding which results from rainfall-generated overland flow before the runoff enters any watercourse, drainage system or sewer. **Fluvial flows** are the flows of watercourses, i.e. rivers, burns etc.

⁷ It should be understood that this means the site for the overall scheme and does not mean the sites for individual houses or components within an overall scheme.

- include the arrangements for its long term maintenance.

There should be appropriate arrangements for surface water drainage during the construction phase of a development site. This could be by way of a SuDS scheme or some alternative interim solution⁸.

Supplementary guidance provides further detail on the levels and requirements for Drainage Impact Assessments.

3 Aims of the Policy

3.1 Policy IN8: Surface Water Drainage and SuDS aims to secure the effective management of surface water in proposed developments. It intends that surface water drainage should be managed in such a way as to protect the water environment, avoid unacceptable flood risk and secure benefits in terms of biodiversity and amenity. This should include arrangements for long term management, i.e. in perpetuity. The policy intends that the built environment should work with, rather than against, the water environment. It should be understood that for Policy IN8 the consideration of SuDS sits within the broader requirements for consideration of surface water drainage in total. **The foundation for this approach is the early consideration of drainage impacts. The preparation of a Drainage Impact Assessment (DIA) will generally be appropriate practice, and may be required.**

4 What the Policy requires

A. In the preparation of all development proposals there must be:

- consideration of drainage issues and arrangements (including surface water flows) from the outset. This is sensible practice and should avoid or minimise difficulties at a later stage in the development design and decision making process.

B. Before a planning application is lodged the following drainage matters should be considered:

- Is the development site at risk of flooding from any source?
- Would development of the site lead to increased flood risk elsewhere?
- Is it recognised that the development design is most likely to require SuDS?
- Is natural water emanating from the site recognised as a possible design issue? This should include consideration of surface or ground water that will not be part of the storm water treatment;
- Is extraneous water (uphill surface or ground water) recognised as a possible design issue? Note: In dealing with this question flood risk issues should not simply be shifted to another location.
- Is there recognition that during construction phases there may be a need to control water contamination and limit flow rates?
- Will a Drainage Statement be sufficient relative to surface water drainage issues, or may a Level 2 or Level 3 DIA be required?
- Will it be possible to design for and manage exceedance flows?
- In urban areas the principles for an integrated approach should be considered. These are:
 - increase the percentage of new surfaces that are permeable;
 - aim to deal with storm water run-off from impermeable surfaces as close to source as possible;
 - replace existing impermeable surfaces with permeable surfaces where possible;
 - minimise the amount of drainage piped or stored underground as this is often

⁸ For sites larger than 4ha the developer will require to obtain authorisation from SEPA for such temporary drainage arrangements.

an inflexible solution that cannot deliver wider benefits or be easily adapted to future conditions;

- maximise opportunities to manage surface water before it enters the sewer system;
- design for exceedance by ensuring that existing and new developments have flood plains and safe flow paths.

C. All applications must include:

- sufficient detail in respect of surface water management arrangements to satisfy the requirements of Policy IN8 and allow the planning authority to make an informed decision.
- appropriate arrangements for surface water drainage during the construction phase of a development site. This could be by way of a SuDS scheme or some alternative interim solution. Any interim solution should intend to avoid adverse effects in terms of both water quality and water quantity and be acceptable to both the planning authority and SEPA.

D. Any planning application may require:

- a Drainage Impact Assessment (DIA) to demonstrate that surface water flows are properly taken into account in the development design. The section further below on *Drainage Impact Assessment (DIA)* indicates the circumstances when these will be expected. **Appendices 1, 2 and 3** set out in more detail what will be required for Drainage Impact Assessments. **Appendix 5** includes documents

that are relevant for the preparation of DIAs. **The consideration of drainage impact at an early stage in the genesis of any proposal is a fundamental element in the policy approach.**

E. Any new development proposal in principle or a full application, but with the exception of single houses and those with direct discharges to coastal waters, will require:

- Sustainable Drainage Systems (SuDS) as a means of treating the surface water and managing flow rates. Advice in respect of SuDS design is provided in documents included in **Appendix 5**.

F. Planning applications must include details of the proposed SuDS which should:

- ensure the system is designed to avoid increasing unacceptable flood risk from exceedance flows. The details must take into account the circumstances when SuDS arrangements are within areas where there is a 0.5% AEP⁹ or more. Further comment on this issue is provided in **Appendix 4**.
- be accommodated within the proposed site and understood as an essential factor in determination of the overall capacity and layout of any site. This means that in addition to the avoidance of unacceptable on-site flood risk any SuDS should be neutral or better with respect to flood risk both up and down stream. For large developments where there is an intention to separate the development into zones, which are to be constructed at different stages, or by different developers,

⁹ **AEP** (Annual Exceedance Probability): This is the accepted measure of the likelihood of a flood occurring at a particular location within a period of one year. For example, a flood with a 1% AEP has a statistical probability of

being reached or exceeded in any year of 1% (1:100). This is often referred to as the 'once in 100 year flood'. It should be noted however, that the occurrence of a flood event does not change the statistical probability of another flood occurring.

a drainage master plan covering the whole area of the development should be submitted. Where off-site SuDS arrangements are seen as being justified, then this must also be within the control of the applicant and form an integral part of the application.

- be based on a unified approach to cover surface water drainage from on-site roads and from the remainder of the site. Roads within the development should discharge into SuDS and developers should include in their proposal how they intend to give the roads authority the necessary rights to connect into and discharge roads water into these systems.
- contribute positively to the biodiversity and general amenity of the area of the proposal. The level of contribution and balance of these factors in any particular case will depend on the specific circumstances of the development. This provision links with:
 - Overarching Policy OP1: Development Considerations, and specifically parts 'b' Biodiversity and Geodiversity, and 'g' Water Environment;
 - Overarching Policy OP2: Design Quality of New Development, in particular the third and final bullet points;
 - Policy NE7: Trees and Development
 - Policy CF2: Green Networks
 - Policy CF3: Open Space

In supporting these policies, it may be that at least part of SuDS arrangements could be incorporated into open space provision.

- Be generated from a coordinated overview relative to new adjacent developments. Whilst a coordinated perspective is required to be carefully considered at the outset, this does not mean that the

finally designed SuDS arrangements *must* be coordinated with the surface drainage arrangements for adjacent sites.

The approach should be pursued on a pragmatic basis. The intention is that it should contribute toward the long term efficiency of drainage arrangements in the general area. Coordination would not be practical if it would add significantly to the costs of surface water drainage arrangements for the proposed development. Treatment at source for individual properties has the potential to lead to pluvial flooding issues. The failure of an 'in-curtilage' system will generally result in ponding and water passing onto the road. In high rainfall events this puts a burden upon the roads drainage for which it is not designed, the consequences of which are potentially flooding and/or road safety issues. In the case of in-curtilage SuDS systems there should be testing to an agreed standard to prove there is sufficient permeability and the deeds should be clear for householders about their maintenance responsibilities. In urban housing schemes it is generally desirable that while SuDS solutions for curtilage water should incorporate source control and be close to the source - they should also be part of overall SuDS solutions at some practical aggregate level for the site.

- include the arrangements for long term maintenance. (This could include being by way of adoption, or deed of conditions.) This is a critical condition for SuDS provision. It is implicit that the arrangements should be reasonable and be seen as practicable over the medium and long term.

G. Building Standards:

- Dumfries and Galloway Council (DGC), as Building Standards authority, must be satisfied that

suitable provision has been made for drainage and prevention of flood risk. Any proposed scheme should be designed and constructed to meet the Technical Standards for compliance with the Building (Scotland) Regulations 2004, as amended.

H. DGC should be given the opportunity to inspect drainage features during and after construction. As built SuDS must have been as agreed by the Council's Roads, Planning, and Building Standards Services. As built drawings of SuDS must be submitted to the Council which may hold them for record purposes.

5 Drainage Impact Assessment¹⁰ (DIA)

5.1 A DIA is a report, prepared by or on behalf of the developer, demonstrating the drainage issues relevant to a proposal and the suitable means of providing drainage (see **Appendix 1: DIA General Guidance**).

5.2 A DIA is site specific and should deal with foul and surface water drainage. **The scope of the DIA will depend on the type and scale of the development and the sensitivity of the area.** Early discussions with DGC and Scottish Water are encouraged, and also with SEPA for those applications of a bigger scale or significant flood risk, including risks related to pluvial flooding.

5.3 Proportionality of DIA: DGC recognises that requirements for drainage impact assessment should be proportionate to the development proposal. Thus, for small developments it will only expect a Drainage Statement, whereas a Level 2 or Level 3 DIA may be required for larger developments (see **Appendix 2: DIA Levels and Content**).

¹⁰ **DIA (Drainage Impact Assessment):** A statement of the drainage issues relevant to a proposal and the suitable means of providing drainage. The length and detail should be proportionate to the issues. As appropriate it

5.4 Drainage design is a complex process, so it is important that all drainage matters are considered at an early stage in the design process. It is expected that a DIA or Drainage Statement will be submitted with the first planning application, whether in principle or full, for any development which requires foul or surface water to be drained (see **Appendix 3: DIA Certification**).

5.5 It is expected that prospective developers will carry out pre-application investigations in respect of surface drainage for schemes, especially those that are larger and/or located in sensitive areas. Whenever possible such investigations about surface water drainage should consider the perspectives of:

- DGC Planning & Building Standards;
- DGC Infrastructure Services;
- SEPA; and
- Scottish Water.

5.6 The following categories of development will require a **Drainage Statement** only to demonstrate the best available options for foul and surface water drainage:

- householder applications;
- developments of four or less new dwellings unless the development may affect a sensitive area (refer to Full DIA);
- non-householder extensions under 100 square metres;
- changes of use not involving new buildings or additional hardstanding;
- where the submission forms part of a larger development for which a full DIA has already been accepted.

may include existing drainage systems and problems, infiltration, groundwater, surface water flow, foul and storm water disposal, SuDS and drainage related flooding issues. See also PAN 61 paragraphs 23 – 24.

Level of Assessment	Completed by	Applicable to	Requirements (refer to main text)
Level 1 Drainage Statement	Architect / Applicant/ Agent	1-4 (Inclusive) property developments; Extensions (between 25-100m ² ; Change of use (not involving substantial new hardstanding/ buildings); Where submission forms part of a larger development where full DIA is provided.	Brief statement; General description of the development, its size, location and surrounding topography and land uses; Description of existing drainage arrangements on site and any sewers; A concept drawing of the development and proposed/ likely means of providing foul and surface water drainage, including SuDS.
Level 2 Drainage Impact Assessment	Civil Engineer or equivalent member of an appropriate professional institution e.g. ICE, CIWEM, INSTRUCTE	Any development not covered above; Larger scale developments > 4 ¹¹ no. properties (offsite risk of flooding may increase).	Report including drawings/ calculations/ figures; Description of existing drainage rights/ arrangements on site; Assessment of pre/ post run off rates, changes in impermeable areas; Evidence of proposed runoff rates and storage volumes for a variety of return periods; Outline Drainage Design showing use/ application of SUDS supported by calculations/ model results; Wastewater drainage proposals including a letter of agreement from Scottish Water to accept foul flows (if applicable); Reporting of onsite porosity tests (where suitable);

¹¹ Developers will require to obtain authorisation from SEPA for these temporary drainage arrangements.

			Proposals relating to discharge rate control methods, receiving water bodies, structures etc.
Level 3 Drainage Impact Assessment	Civil Engineer or equivalent member of an appropriate professional institution e.g. ICE, CIWEM, INSTRUCTE	Where pluvial flood risk is known/ offsite flooding impermeable areas a risk; Larger scale developments > 5 no. properties (offsite risk of flooding may increase).	As Level 2 but also including detailed Topographic Site Survey.

6 Monitoring the Policy

6.1 SuDS seeks to take account of water quality, water quantity and biodiversity and amenity. By considering all three functions it should be possible to provide adequate and well designed systems that offer water quality treatment through natural process inherent in the system, encourage infiltration where appropriate and attenuate peak flows in addition to providing habitat and function for those using the area, including the local community and wildlife.

6.2 Successful implementation of the policy should also support the effective long term maintenance of schemes. The

arrangements should be clear and be seen as workable and realistic. There should be confidence that they will endure and be capable of responding positively to practical or administrative issues that may arise in the future.

6.3 The planning system should log all new SuDS and the respective arrangements that have formed part of new development for which planning permission has been secured. With this information to hand, it should then be possible after some years of operation, to make an assessment as to how effective the policy has been in achieving the above noted objectives.

APPENDIX 1: DIA General Guidance

The DIA should demonstrate that the surface water drainage system takes account of SuDS principles and specifications in accordance with current legislation and guidelines such as the CIRIA Publication C753 - The current version of SuDS Manual, or Sewers for Scotland 3. See **Appendix 5** for reference documents.

Private waste water provisions: If a proposed development is reliant on private foul water or private surface water provisions then the long term maintenance requirements and ownership of the proposed foul water system should be addressed in the DIA. For multiple-house developments the long term sustainability and in particular the liability of shared

systems should be considered as part of the DIA process.

Approvals: Throughout the planning process the DIA will form the basis of statutory consultation with the appropriate bodies:

- Scottish Water (drainage connection consent)
- DGC (planning permission and adoption of road drainage)
- SEPA (CAR authorisation)

Final Drainage Design: A final drainage design should be submitted and approved by the Planning Authority (in consultation with SEPA for larger scale developments) before the commencement of any development. This will usually be made a condition for full planning approval (see **Appendix 3: DIA Certification**).

APPENDIX 2: DIA Levels and Content

Table 1: Drainage Statement

DIA Level				A Drainage Statement should typically include the following
1	2	3		
√			1	A description of the existing drainage characteristics of the site including general/ surrounding topography, the existence of any public sewers in the area.
√			2	A concept drawing of the proposed development including proposed/ anticipated drainage arrangements; identification of likely permeable and impermeable (hardstanding) areas (including a summary of area sizes).

Table 2: FULL DIA

DIA Level				A DIA is required to meet the following basic requirements and any additional site-specific requirements specified by DGC. Requirements may include:
1	2	3		
√	√	√	1	A description of the existing drainage characteristics of the site including general/ surrounding topography, the existence of any public sewers in the area.
√	√	√	2	A concept drawing of the proposed development including proposed/ anticipated drainage arrangements; identification of likely permeable and impermeable (hardstanding) areas (including a summary of area sizes).
	√	√	3	An examination of the current and historical drainage rights.
	√	√	4	An outline drawing of how the drainage design provides SuDS techniques in accordance with recognised design manuals.
	√	√	5	Waste water drainage proposals.
	√	√	6	If connection to a public sewer is proposed then agreement letter from Scottish Water should be provided.
	√	√	7	If no public sewer is available in the settlement then evidence of compliance with SEPA's Policy and Supporting Guidance on the Provision of Waste Water Drainage in Settlements (Appendix 5, Document 17).
	√	√	8	Subsoil porosity tests at the location of any intended infiltration device and the proximity of the seasonally highest water table.
	√	√	9	The soil classification of the site.
	√	√	10	If any discharge is to be made to a body of water then the intended rate of discharge, the point of discharge and the outfall structure proposals should be provided.
	√	√	11	Calculations comparing pre- and post development runoff rates for a range of storm events (e.g. 1:2, 1:30, 1:100 and 1:200 return periods) if applicable. There should be an additional allowance for the potential impacts of climate change in accordance with UKCP09 or more recent climate projections for the UK.
	√	√	12	Demonstration that post development peak run-off volumes do not exceed that for pre-development for the range of return periods i.e. that the pre-development drainage situation is improved or at least mimicked.
	√	√	13	Demonstration that the drainage solution selected will ensure that properties on and off the proposed site are not at risk of flooding

				from the appropriate rainfall return period, i.e. up to 0.5% AEP (or 1:200 annual return period).
	√	√	14	Details of the accountable body responsible for vesting and maintenance for individual aspects of the drainage proposals and confirmation in writing that these bodies will vest/adopt the system.
	√	√	15	Waste water drainage proposals and confirmation in writing that they will vest in Scottish Water (if applicable).
	√	√	16	Confirmation of measures to be employed to manage surface water runoff during the construction phase.
	√	√	17	Conclusion about whether further drainage investigation or a Flood Risk Assessment is required.
		√	18	Topographical survey of the site and adjoining land if available.

APPENDIX 3: DIA Certification

Level 1 Drainage Statements may be completed and submitted by the applicant, architect or agent acting for the client.

Level 2 and 3 Drainage Impact Assessments should be undertaken by a competent professional. It is recommended that assessments should be carried out under the direction of a chartered member of a relevant professional institution, with experience of flood risk/drainage assessment and management.

In addition Level 2 & 3 DIAs must be accompanied by a signed-off Compliance Certificate to certify that the assessment(s) has been carried out in accordance with this guidance, relevant

documents and legislation. An individual Compliance Certificate (see example form below) must be submitted for each assessment. DGC also requires that the signatory company holds Professional Indemnity Insurance which is maintained at a level that is at least appropriate for the development proposed. Evidence will take the form of a copy of the insurance policy, certificate of insurance and evidence that all premiums are paid and up to date for a minimum of ten years.

It is the responsibility of the author(s) to ensure that all detailed calculations and computations are technically accurate. DGC is reliant on the accuracy, completeness and timeliness of information submitted.

DRAINAGE IMPACT ASSESSMENT: COMPLIANCE CERTIFICATE	
Assessment Ref No:	Assessment Date:
Name of Proposed Development:	
Address:	
Name of Prospective Developer:	
Name of Address of Organisation preparing this Assessment:	
Insurance held appropriate to the level of development proposed:	
Name of Approver:	
Signed:	Date:
Position Held:	
Name and Qualification of person responsible for signing off this Assessment:	

APPENDIX 4: SuDS and Design Exceedance

The DIA should demonstrate, using up to date techniques, that the post-development runoff rate and volume do not exceed the pre-development runoff rate and volume for Brownfield sites, or the Greenfield runoff rate for previously undeveloped sites. More importantly, the proposed method used for drainage should ensure that there is no increase in unacceptable flood risk either on or off site. SuDS schemes are typically designed to accommodate 1:30 AEP flows. SuDS arrangements must include design for exceedance flows for events with an AEP between 1:30 and 1:200, so that there is no overall increase in unacceptable on or off-site flood risk.

Formal on-site storage should be provided up to the 1 in 30 AEP event and attenuation measures should be designed such that SuDS features will not surcharge during a 1:30 AEP rainfall event. In respect of a potential design exceedance event, the DIA requires to include an assessment and consideration of the flood flow route for the appropriate return period flood event. The design is required to demonstrate that there will be no detriment to land or property elsewhere as a result of overland flow caused by the development.

The IH124 method is the preferred approach for calculating Greenfield run-off from development sites (see **Appendix 5**, documents 37 and 38). In areas of existing flood risk the Council may seek a significant reduction in post development runoff: For catchments less than 50ha, calculations should be undertaken for a catchment area of 50ha and pro-rata'ed to that of the development catchment area.

A sensitivity test to ensure that there is no flooding to property or critical roads during a 1 in 200 AEP rainfall event is also required. The 1 in 200 AEP event should be contained on-site. Information should be provided to demonstrate how this is to be achieved. An alternative may be considered if it can be demonstrated that a 1:200 AEP event could be managed appropriately without causing an unacceptable flood risk somewhere else. A flood routing exercise should be undertaken to clearly illustrate where flood water generated by such extreme events will be routed.

With regard to ponds and detention basins the DIA should demonstrate a safe mechanism for overtopping within these features in the event of the design capacity being exceeded during extreme rainfall events. Overtopping of these features must not lead to flooding of property or critical infrastructure and preferential flood flow paths should be identified in the event of overtopping.

Information should be provided on the anticipated drain down time for any attenuation facilities. The SuDS Manual (Appendix 5, document 23) notes (Section 3-8) that storage should drain down from full to empty within 24 to 48 hours. If the drain down time is more than 24 hours, then long duration events should be assessed to ensure that the storage is not overwhelmed by long periods of rainfall or consecutive high intensity storm events.

Long sections through the proposed surface water system should be provided showing the proposed 'first-flood' manhole locations and likely overland flow routes for return periods greater than the 1 in 30 year event (and up to the 1 in 200 year event).

APPENDIX 5¹²: FRA Reference Documents

1. Flood Risk Management Strategy for Solway Local Plan District (2015)
<http://apps.sepa.org.uk/FRMStrategies/solway.html>
2. Solway Local Plan District Local Flood Risk Management Plan: June 2016
https://www.dumgal.gov.uk/media/18252/Solway-Local-Flood-Risk-Management-Plan/pdf/Solway_LPD_Local_FRM_V_Committee_14_June_2016.pdf?m=636011502680800000
3. Flood Risk Management (Scotland) Act 2009
<http://www.legislation.gov.uk/asp/2009/6/contents>
4. The Building (Scotland) Regulations 2004
<http://www.legislation.gov.uk/ssi/2004/406/contents/made>
5. Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) (as amended)
<http://www.legislation.gov.uk/ssi/2011/209/made>
6. Scottish Government; Scottish Planning Policy; June 2014
<http://www.scotland.gov.uk/Resource/0045/00453827.pdf>
7. Planning Advice Note 51: Planning, Environmental Protection and Regulation
<http://www.scotland.gov.uk/Resource/Doc/152228/0040973.pdf>
8. Planning Advice Note 61: Planning and Sustainable Urban Drainage Systems; 2001
<http://www.scotland.gov.uk/Publications/2001/07/pan61>
<https://beta.gov.scot/publications/pan-61-sustainable-urban-drainage-systems/>
9. Planning Advice Note 69: Planning and Building Standards Advice on Flooding
<http://www.scotland.gov.uk/Resource/Doc/17002/0026290.pdf>
10. Planning Advice Note 79: Water and Drainage
<http://www.scotland.gov.uk/Publications/2006/09/26152857/0>
11. Scottish Government: Delivering Sustainable Flood Risk Management
<https://www.gov.scot/publications/flood-risk-management-scotland-act-2009-delivering-sustainable-flood-risk/>
12. Scottish Government: Surface Water Management Planning Guidance
<http://www.scotland.gov.uk/Resource/0041/00413778.pdf>
13. SEPA; Flood Maps: First Published January 2014 (website)
http://www.sepa.org.uk/flooding/flood_maps.aspx

¹² **Note:** Some of the SEPA internet links are to a SEPA webpage on which the document is a download. Most of the CIRIA links are to a CIRIA page from which the document may be accessed. However this may require that those interested in the document be logged in to the CIRIA site.

14. SEPA; Controlled Activities Regulations 2011 - A Practical Guide

https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf

15. SEPA; 'Guidance and advice notes' for Planning (webpage)

<https://www.sepa.org.uk/environment/land/planning/guidance-and-advice-notes/>

- Development Management Guidance on Flood Risk
- Planning Information Note 4: SEPA Position on development protected by a Flood Protection Scheme
- Development Plan Guidance on flood risk
- Background Paper on Flood Risk
- Flood Risk and Land Use Vulnerability Guidance
- Planning Information Note 3: Flood Risk Advice for Planning Authorities

16. SEPA Flood line

<http://www.floodlinescotland.org.uk/>

17. SEPA; Technical Flood Risk Guidance for Stakeholders:

<https://www.sepa.org.uk/media/162602/ss-nfr-p-002-technical-flood-risk-guidance-for-stakeholders.pdf>

Or as downloaded from:

<https://www.sepa.org.uk/environment/land/planning/guidance-and-advice-notes/>

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Acronyms

AEP Annual Exceedance Probability
CAR Water Environment (Controlled Activities) Regulations 2011
CEH Centre for Ecology and Hydrology
DIA Drainage Impact Assessments
DGC Dumfries & Galloway Council
CIRIA Construction Industry Research and Information Association
FRA Flood Risk Assessment
GBR General Binding Rule (under CAR)
LDP2 Local Development Plan 2
SEPA Scottish Environment Protection Agency
PAN Planning Advice Note
SPP Scottish Planning Policy
SuDS Sustainable Drainage Systems
SW Scottish Water

Glossary

AEP (Annual Exceedance Probability):
This is the accepted measure of the likelihood of a flood occurring at a particular location within a period of one year. For example, a flood with a 1% AEP has a statistical probability of being reached or exceeded in any year of 1% (1:100). This is often referred to as the 'once in 100 year flood'. It should be noted however, that the occurrence of a flood event does not change the statistical probability of another flood occurring.

Brownfield: Previously developed land and premises, including the curtilage of buildings, which may still be partially occupied or used. Most commonly associated with derelict urban land with redundant industrial buildings. Excludes agriculture, forestry and previously used land which now has nature conservation or recreation value.

DIA (Drainage Impact Assessment): A statement of the drainage issues relevant to a proposal and the suitable means of providing drainage. The length and detail should be proportionate to the issues. As appropriate it may include existing drainage systems and problems, infiltration, groundwater, surface water flow, foul and storm water disposal, SuDS

and drainage related flooding issues. See also PAN 61 paragraphs 23 – 24.

Flood Plain: Generally low lying areas adjacent to a watercourse, tidal lengths of the river or sea, where water flows in times of flood or would flow but for the presence of flood defences. SPP says that this is the equivalent to the 1:200 AEP area.

Flood Risk Assessment: An assessment of the likelihood of flooding in a particular area so that development needs and mitigation measures can be carefully considered. 24 draft

Freeboard: This is often defined as the difference between the flood defence level and the design flood level. It can also however be the difference between the design flood level and the finished floor levels of any development. Freeboard is required to account for (a) the uncertainties involved in flood design and (b) physical imponderables such as post-construction settlement or wave action. Any allowance for climate change should be independent of the freeboard allowance.

Greenfield: Land not previously developed, can include agricultural land.

Relevant Bodies of Water: Expression used in the Flood Risk Management (Scotland) Act 2009 to defines those bodies of water (other than canals) that a local authority should assess for the purpose of ascertaining whether their condition gives rise to a risk of flooding of land within or outwith its area.

Sustainable Drainage System (SuDS): These are designed to reduce the potential impact of developments with respect to surface water discharges by replicating natural systems of drainage (rather than by routing water through solid pipes) allowing water to be released slowly back into the environment