



Drainage Impact Assessment



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Guidance for Developers and Regulators

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Purpose

This booklet is produced on behalf of the North East Scotland Flooding Advisory Group and is intended to assist developers and agents, development control officers and others involved in approving waste and surface water drainage facilities for new developments.

It provides guidance on the new requirement for the preparation and submission of a Drainage Impact Assessment (DIA) for new developments and informs practitioners of the circumstances where pre-application meetings may be of benefit. In discussing surface water drainage, the guidance emphasises the need for Sustainable Urban Drainage Systems (SUDS)¹. The important issue of future maintenance of SUDS is not dealt with here, but is being considered under the Water Bill. Readers should endeavour to keep up to date with developments in this Bill and with revised Part M of the Building Standards (Scotland) Regulations 1990 (as amended) due to come into force in March 2002.

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Section 1

1.1 Introduction

This booklet provides advice on the scope of the Drainage Impact Assessment (DIA) required for different types of development. Drainage is a material consideration at the planning stage of a development^{2,3} and due consideration must be given to the impact of the proposed development on the catchment area. This includes an assessment of potential for both flood risk and pollution.

A DIA should be submitted with the first planning application, either outline or full, for any development which requires waste or surface water to be drained. The following categories of development will not require a DIA, but the best available option for waste and surface water drainage is expected to be demonstrated:

- householder applications;
- developments of less than ten new dwelling houses unless the development may affect a sensitive area (refer to section 2.1);
- non-householder extensions under 100 square metres;
- changes of use not involving new buildings or hardsurfacing;
- where the submission forms part of a larger development for which a DIA has already been accepted.





Submission of a DIA with all the information required (refer to section 2.4) will expedite consideration of the planning application. Failure to demonstrate that a satisfactory means of waste or surface water drainage can be provided may lead to refusal of planning permission.

A DIA is site specific and should deal with waste and surface water drainage. The latter should be drained according to the principles of SUDS¹, which have the benefit of taking account of water quantity, water quality and environmental and amenity issues. SUDS mimic natural systems by providing storage, flow attenuation and biological treatment. They can be integrated into the environment as visually attractive features, which can also provide wildlife habitats that would otherwise be scarce in the built environment.

Sustainable solutions for drainage will only be achieved by co-operation between all the organisations involved in the development of land.

1.2 Legislation

The planning authority is responsible for control of development under the Town and Country Planning (Scotland) Act 1997. Structure and local plans determine the councils' policies in relation to drainage and flooding and SUDS are a requirement of the North East Structure Plan. The Flood Prevention and Land Drainage Act 1997 places a burden on the local authority to reduce the likelihood of flooding on non-agricultural land. National Planning Policy Guidance NPPG 72 advises on flood management and Planning Advice Note PAN 613 gives advice on good practice in planning SUDS.

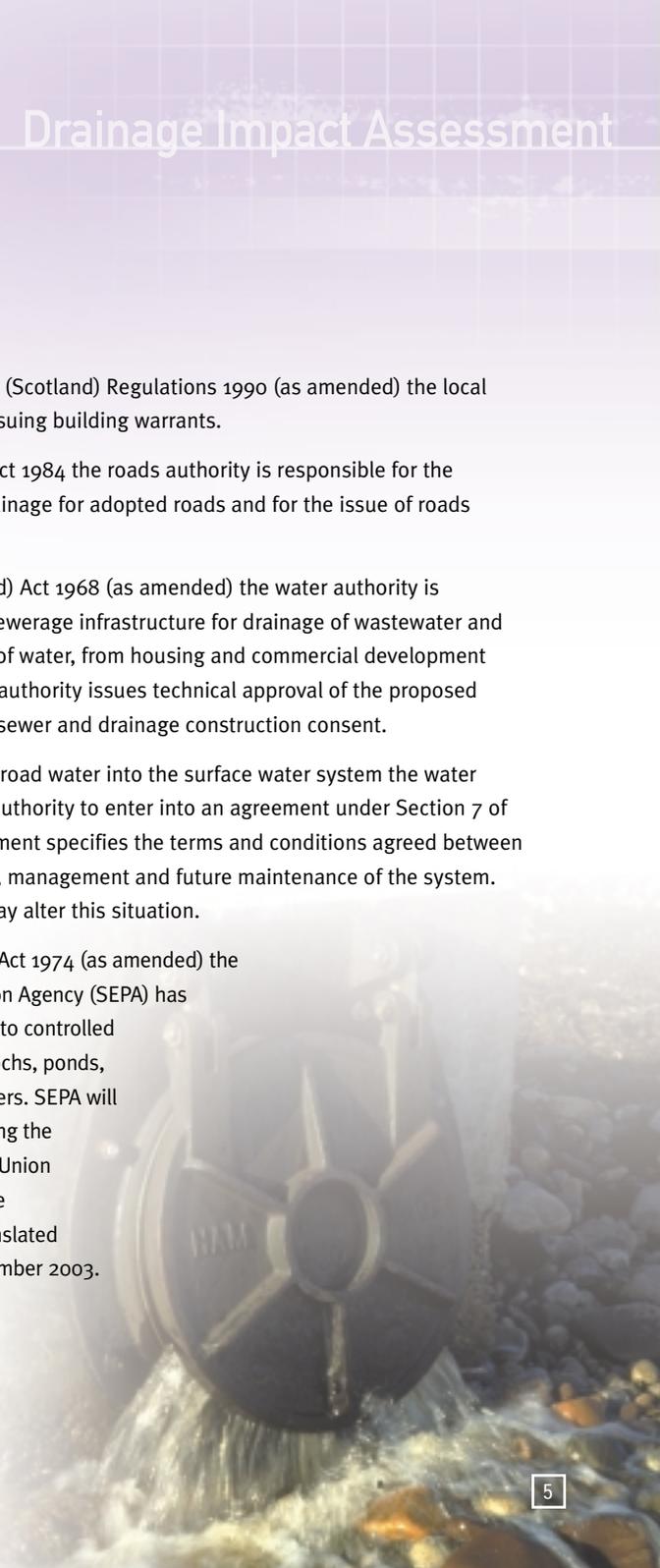
Under the Building Standards (Scotland) Regulations 1990 (as amended) the local authority is responsible for issuing building warrants.

Under the Roads (Scotland) Act 1984 the roads authority is responsible for the provision of surface water drainage for adopted roads and for the issue of roads construction consent.

Under the Sewerage (Scotland) Act 1968 (as amended) the water authority is responsible for provision of sewerage infrastructure for drainage of wastewater and curtilage run-off, including roof water, from housing and commercial development where practicable. The water authority issues technical approval of the proposed sewerage infrastructure, and sewer and drainage construction consent.

Where it is proposed to drain road water into the surface water system the water authority requires the roads authority to enter into an agreement under Section 7 of the Sewerage Act. This agreement specifies the terms and conditions agreed between both parties for the provision, management and future maintenance of the system. Provisions in the Water Bill may alter this situation.

Under the Control of Pollution Act 1974 (as amended) the Scottish Environment Protection Agency (SEPA) has powers to regulate discharges to controlled waters, which include rivers, lochs, ponds, groundwaters and coastal waters. SEPA will have a lead role in implementing the requirements of the European Union Water Framework Directive, the provisions of which will be translated into Scots Law before 22 December 2003.



Section 2

2.1 Surface Water Drainage

The DIA should demonstrate that the surface water drainage system takes account of SUDS principles in accordance with the design manual for Scotland and Northern Ireland¹. Where SUDS solutions are not possible the DIA should identify the principles behind the chosen approach and demonstrate that the method that gives the best environmental protection available at the site is adopted.

The scope of the DIA will depend on the type and scale of the development and the sensitivity of the area.

Sensitive areas should be defined unambiguously and may be:

- areas where there is no available public sewer;
- areas affected by flooding;
- areas with high water table problems;
- receiving waters with no capacity for additional flow;
- bathing areas;
- fisheries;
- areas within or upstream of a conservation site designated under national or international legislation, for example a Site of Special Scientific Interest (SSSI);
- areas where drainage may affect a non-designated conservation site or amenity such as a public park or picnic site; and
- contaminated land.

Guidance on the scope of the DIA for different types of development is given in section 2.4.



2.2 Wastewater Drainage

Where a development will lead to the production of wastewater, a DIA should always include a section on wastewater drainage. It should examine the availability of public sewers to carry wastewater from the development. The water authority can provide advice on the procedure for obtaining connection to the public sewer and for obtaining a contribution towards infrastructure provision. For further information refer to NoSWA Site Servicing of Housing, Industrial and Commercial Developments⁷. The water authority will not allow wastewater to be pumped to the public sewer unless the developer demonstrates that a gravity system is not feasible.

Where a public sewer is not available the developer should first discuss with the water authority the possibility of providing a public sewer to carry wastewater to an existing public Wastewater Treatment Plant (WWTP). For further information refer to SEPA Pollution Prevention Guidelines⁸.





If such provision is not a viable option the developer will need to consider providing foul sewerage and a WWTP and consult with the water authority on the acceptability of the system. NoSWA have a Cordon Sanitaire policy and the documents entitled ‘Guidelines for the adoption of proposed new private WWTP and sewerage systems’ and ‘Technical requirements for prospectively adoptable WWTP’s’ can be obtained from NoSWA. Where a developer is required to provide a new WWTP to serve their proposed development, the water authority requires that they enter into an agreement under section 8 of the Sewerage (Scotland) Act.

It is SEPA’s stated preference that the drainage system and treatment plant are publicly maintained. If this is not possible the developer should consult SEPA when a discharge of sewage effluent to land or controlled waters including rivers, lochs, groundwater and coastal waters is proposed. In this situation SEPA prefers discharge to land via a properly designed soakaway system and such a discharge may require an application for consent. Discharge of sewage effluent to controlled waters always requires consent from SEPA and there is a presumption for full biological treatment.

A satisfactory means of wastewater disposal must be demonstrated at the planning stage. Aberdeenshire Council has published a leaflet entitled ‘Providing Drainage for New Development when Public Sewers are not Available’. This outlines the practices, procedures and certification to be followed at the planning stage for private wastewater systems.

2.3 Pre-Application Meetings

In some cases, particularly for larger developments or developments which drain to sensitive waters, a pre-application meeting will be helpful to all parties in establishing a common understanding of proposals and will assist the processing of applications. Such a meeting will be held at the discretion of the planning authority. It is suggested that a pre-application meeting should be held for developments in sensitive areas or for developments of either more than 40 houses or more than two hectares in area.

The developer is advised to contact the planning officer at an early stage to agree on the requirement for a pre-application meeting. The planning officer will arrange the meeting and it is expected that it will be attended by representatives of the developer, planning authority, building control (brownfield and larger greenfield sites), roads authority, water authority and SEPA, as appropriate. To ensure maximum benefit from the meeting the developer should submit proposals for addressing the drainage issues (draft DIA) to the attendees before the meeting.



The purpose of the meeting will be to agree the objectives for the drainage scheme, to discuss with the developer the proposals for the drainage of the site and agree any necessary amendments to the layout. Surface water drainage objectives might include one or more of peak discharge control, volume control, groundwater recharge, erosion control, pollution control and habitat enhancement.

The outcome of the meeting will be an agreement on any further work required prior to submission of the DIA with either the outline or the full planning application.

The DIA should be satisfactory to all the appropriate authorities, before being accepted by the planning authority and proposals must be incorporated in plans. Conditions of planning permission are likely to apply, so all land required for SUDS measures must be included within the site (red line) or on land in the applicant's control (blue line).

Acceptance of a DIA does not constitute approval of detail but it does demonstrate that the approving bodies are satisfied in principle with the proposed drainage scheme.

2.4 Drainage Impact Assessment

For all applications other than the types identified in section 1.1, a DIA should be carried out in accordance with the principles of sustainable drainage. The submitted DIA should include the following basic requirements and additional requirements where specified by the planning authority. The developer should confirm the requirements before preparing the DIA.

Basic requirements - or as otherwise agreed with the planning authority

- an examination of the current and historical drainage patterns;
- a concept drawing of the development proposal;
- a brief summary of how the drainage design provides SUDS techniques in accordance with the design manual;
- summary of SUDS to be incorporated (refer to the selection tool within the design manual);
- the soil classification for the site;
- evidence of subsoil porosity tests including where possible at the location of any intended infiltration device;
- calculations showing the pre- and post-development peak run-off flow rate for the critical rainfall event (refer to section 3);
- attenuation designed for a 10 year return period rainfall event;
- wastewater drainage proposals;
- confirmation of maintenance responsibility; and
- a copy of a letter from the water authority giving the location of the nearest public sewers and confirmation of their availability for servicing the site.





Section 3

Additional requirements - may be specified by the planning authority

- a drainage plan identifying the type(s) of SUDS to be incorporated and SUDS land take including temporary or sacrificial SUDS for dealing with construction run-off;
- take into account possible future development;
- a description of the design of safety measures to render SUDS acceptably safe (refer to Safety at Inland Water Sites⁵);
- calculations showing the attenuation required so that the post-development run-off volume does not exceed that for pre-development for the critical rainfall events (refer to section 3);
- assessment of flood risk including consideration of the flow route for 50 and 200 year* return period rainfall events showing no detriment to land or property as a result of overland flow (refer to section 3);
- calculation of the treatment volume (V_T) and required multiples thereof and demonstration that the level of treatment and available treatment volume in the SUDS is adequate. Swales as conveyance systems contribute to the total V_T ;
- additional level of treatment for discharge to fisheries, bathing or conservation areas;
- a method statement detailing how contaminated water arising during construction will be dealt with (refer to Control of Water Pollution From Construction Sites⁶).
- proposals for integrating the drainage system into the landscape or required public open space;
- survey of existing habitats and species;
- demonstration of good ecological practice including habitat enhancement. Refer to guidance on good practice in the management and creation of small waterbodies in Scotland⁴;



3.1 General Requirement for Surface Water Run-off

In general terms the rate and volume of surface water run-off from the post-development situation should not exceed the surface water run-off from the existing site.

3.2 Attenuation Measures

The design of the SUDS measures on the site should be as follows using simulation to determine the critical duration associated with specified rainfall return periods:-

- i) Attenuation measures should be designed such that SUDS features will not overflow during a 10-year return period rainfall event.
- ii) A sensitivity test to assess the effect of the 50 year return period rainfall event on the surrounding property and road network, to ensure that failure of the measures will not have a detrimental effect on these areas, may be required.
- iii) A further sensitivity test to ensure that there is no flooding to property during the 200*-year return period rainfall event may also be required.

*or such other periods as is set out in the local plan for the area.

3.3 Technical Requirements for Surface Water Run-off

3.3.1 Where existing watercourses are being used to discharge the run-off from the development, the attenuation measures should be designed so as to retain any additional peak hour flows on the development site.

In these types of location the developer is firstly required to calculate the pre-development run-off for the existing site. In general the two year one hour rainfall event should be used but other events may need to be attenuated if downstream erosion is a problem.

In general soil porosity test results should be used in the calculation of pre-development run-off. Where this is not possible, if the scheme is relatively minor and the area is grassed or forested, the run-off rate can be assumed to be 8%.

The discharge rate from the developed site should not exceed the pre-development discharge rate. In general the measures should be designed to ensure that flow arising from a 10 year return period rainfall event is attenuated on the site then released at a rate no greater than the pre-development peak hour flow rate.

Where the developer is unable to fully meet these requirements and additional discharges are proposed to a watercourse, the developer will be required to demonstrate that the proposal will not have a detrimental effect on the watercourse or the surrounding land.

The precise location and release rate for attenuation devices should be considered in the context of the catchment. Care may be required where an attenuation device is situated at the lower end of a catchment since run-off may be detained just long enough to coincide with the arrival of the peak flow from the upper part of the catchment.

3.3.2 Where the site is already served by a public sewer or where the water authority is seeking to limit discharges to the existing public sewers, developers in certain circumstances may be required to discharge to the nearest watercourse. In these circumstances the volume of any additional discharges should be agreed with the drainage authority or whichever body controls the watercourse and the developer should demonstrate that the proposal will not have a detrimental effect on the watercourse or the surrounding land.

Similarly where additional discharges are being made to water authority pipes the rate of the discharges should be agreed with the water authority.





3.4 Design of Surface Water Drainage Systems

In general, the design of surface water drainage is assisted by a number of publications including those published by the Institute of Hydrology^{10, 11, 12}, British Research Establishment, Construction Industry Research and Information Association (CIRIA)^{1, 6, 13, 14}, the Natural Environment Research Council⁹, Scottish Executive^{2, 3, 15}, River Restoration Centre¹⁶, NoSWA⁷, SEPA^{4, 17, 19}, Institution of Chartered Engineers (ICE)¹⁸, Aberdeenshire and Aberdeen City Councils²⁰ and the University of Abertay, uwtc@tay.ac.uk.



References

- 1) Sustainable urban drainage systems. Design manual for Scotland and Northern Ireland, CIRIA Report C521, London 2000
- 2) Planning and Flooding National Planning Policy Guidance, NPPG 7, 1995
- 3) Planning and Sustainable Urban Drainage Systems, Planning Advice Note PAN 61, 2001
- 4) Ponds, Pools and Lochans, SEPA, 2000
- 5) Safety at Inland Water Sites, RoSPA, Birmingham, 1999
- 6) Control of Water Pollution From Construction Sites - Guidance For Constructors And Contractors, CIRIA Report 532, London 2001
- 7) Site Servicing of Housing, Industrial And Commercial Developments NoSWA* 2000
- 8) Disposal of Sewage Where No Mains Drainage is Available PPG4, SEPA
- 9) Flood Studies Report, NERC, London 1975
- 10) Flood Estimation Handbook, Institute of Hydrology, Wallingford 1999
- 11) The Wallingford Procedure UK Edition, Wallingford 1980
- 12) The Wallingford Procedure Europe Edition, Wallingford 2001
- 13) Scope For Control of Urban Run-off, CIRIA Report 123, London 1992
- 14) Infiltration Drainage Manual of Good Practice, CIRIA Report 156, London 1996
- 15) Natural Heritage National Planning Policy Guidance, NPPG 14, 1999
- 16) Manual of River Restoration Techniques, River Restoration Centre, 1999
- 17) Watercourses in the community, SEPA, 2000
- 18) Returning Watercourses to the community, ICE, 2000
- 19) Culverting, an agenda for action, SEPA, 2000
- 20) Works to watercourses and their banks Flooding and Development, Aberdeenshire and Aberdeen City Councils, 2001

* subject to the provisions of the Water Bill, NoSWA will become part of Scottish Water with effect from 1 April 2002.