

FLOODING & DRAINAGE

Supplementary Planning Guidance: SPG 09 NLLP Policy DSP.4

Copies available from Planning and Development, Fleming House, Cumbernauld G67 1JW - or esdesign@northlan.gov.uk

BACKGROUND

1. In recent years increasing numbers of applications for development have been received for land which may be vulnerable to flooding or at locations where development may increase existing flooding problems or exacerbate flooding elsewhere within the same river catchment.
2. All types of flooding are predicted to increase because of the impact of climate change. Many climate change models suggest both more rainfall for Scotland and a greater frequency of more extreme rainfall events. This guidance sets out how the Council will assess such applications - and identifies the areas where self certification is appropriate (see sections D and E).
3. Careful planning ahead is needed to anticipate the worst case scenarios, to plan for Climate Change and minimise flooding risk. Much can be done by reducing water usage in the first place and by saving and storing for reuse as much water as possible locally. SUDS (Sustainable Urban Drainage Systems) main purpose is to mimic natural water runoff processes as closely as possible so as to achieve a balance between the quality of runoff, quantity of runoff and provision of amenity. They can also attenuate flow, reducing or preventing flooding.

AIM OF THIS GUIDANCE

1. The purpose of this document is to
 - Provide information about flooding and flood risk reduction through sustainable flood risk management.
 - Advise of requirements for preparation and submission of Flood Risk Assessments and Drainage Assessments
 - Provide guidance regarding the use and maintenance of Sustainable Urban Drainage Systems (SUDS).
2. It is intended as guidance for developers, landowners, planning practitioners and others involved in the development process.
3. A Sustainable Urban Drainage systems (or SUDS) approach will normally be expected on all new developments with the exception of discharges from single dwelling units. Suitable SUDS measures will be required to contribute to sustainable management of water resources.

This leaflet seeks to explain what this means and sets out how the Council will assess applications to ensure they minimise floor risk and adopt a sustainable drainage approach.



Natural watercourses need to be maintained

The latest Supplementary Planning Guidance can be found online at:- www.northlanarkshire.gov.uk/spg



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The council will seek to ensure these principles are achieved through the development management process

A. ROLES AND RESPONSIBILITIES

Public responsibilities for flooding issues are allocated to a broad range of agencies. Formal approval for a drainage system is needed from the following authorities:

A. Planning Authority

North Lanarkshire Council as the local planning authority is responsible for the control of development under Planning legislation and HAS a duty to reduce overall flood risk under the Flood Risk Management (Scotland) Act (2009). The local authority has a requirement to:

- consider drainage matters as a material consideration in assessing planning applications for new developments.
- consult SEPA, Scottish Water & the local roads authority each of whom has responsibilities for assessment under relevant legislation.
- consider flood risk management issues



A series of detention ponds, Auchenkilns, Cumbernauld

2. Building Standards

The Council's Building Standards service requires that adequate provision has been made for drainage as part of the building warrant process (Standard 3.6). Proposed SUDS systems should be designed and constructed to comply with Regulation 9, Section 3 of the Building (Scotland) Act 2004 (as amended). Sustainable drainage is included in Part M of the Building (Procedure) (Scotland) Regulations 2004 for areas with more than 200sqm of hard surfaces.

3. Roads Authority

North Lanarkshire Council as local roads authority is responsible for the provision of surface water drainage from adopted public roads and for the issue of roads construction consents. Drainage systems incorporated as part of a design require to meet drainage requirements of the Roads (Scotland) Act 1984 to satisfy road construction consent requirements.

4. Water and Sewerage Authority

Scottish Water is the Water and Sewerage is responsible under the terms of the Sewerage (Scotland) Act 1968, (as amended), for provision of sewerage infrastructure for domestic sewerage, trade effluent and some categories of surface water.

5. Environmental Protection

The Scottish Environment Protection Agency, (SEPA),

- has the primary strategic role within flooding - and is a statutory consultee for planning applications regarding flood risk issues - see their Position Statement
- provides advice to planners and developers regarding flood risks - see their technical Flood Risk Guidance for Stakeholders (Section I on p.11)
- has prepared the Indicative River and Coastal Flood Map which indicates the potential risk of flooding for an area from the 1 in 200 year flood event.
- requires to be informed where development may involve discharges to the water environment, abstractions, impoundments, river engineering (including culverting) under the Water Environment (Controlled Activities) (Scotland) Regulations 2005. If unsure if you fall into this category, contact SEPA www.sepa.org.uk

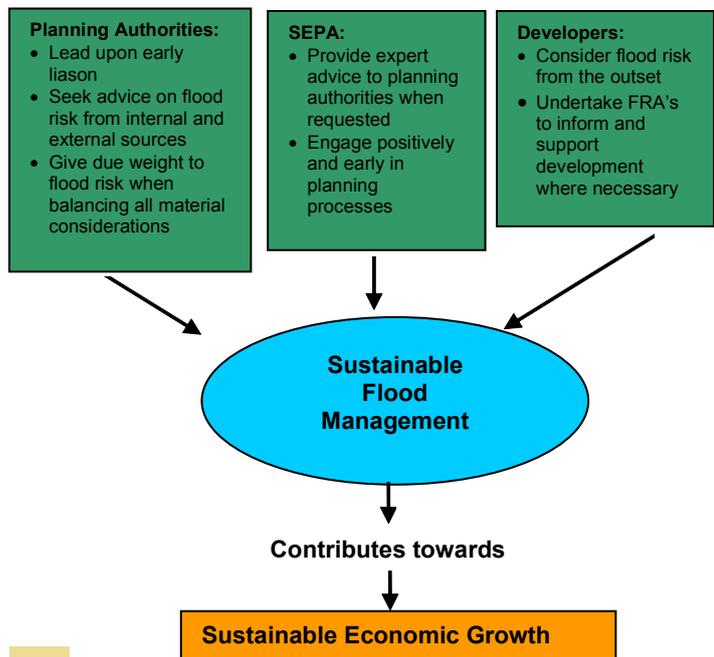
6. Nature Conservation

www.snh.org.uk Scottish Natural Heritage is a statutory consultee.

- Any assessment of development and drainage impacts should ensure that protected species are not adversely affected.
- SNH has responsibility to advise regarding protection of key nature conservation areas including both statutory designated sites and the wider environment.
- SNH can advise regarding the creation of wildlife habitat within some SUDS systems.

North Lanarkshire Local Plan
Policy DSP2 (B) (3) Environmental Assets:
 requires new development proposals to protect and enhance watercourses.
Policy DSP4 (3) requires a high quality development in terms of:
 (e) **Ensuring that waterbody status is protected and, wherever possible, enhanced.** Status includes physical characteristics, so proposals such as culverting will only be considered where no other practical option exists. Foul water should connect to the public sewer - alternatives to this will only be permitted where no public system exists and the alternative does not pose an environmental risk. Sustainable Urban Drainage Systems should be adopted within site design and appropriate details require to be submitted with any planning application.

The new Scottish Government Planning Policy (SPP) advises that drainage is a material planning consideration. New development should not be at risk from flooding, materially increase the probability of flooding elsewhere or increase areas of land which require protection by flood prevention measures, (SPP7 para.15). The SPP encourages the use of sustainable drainage systems (SUDS) wherever practical.



B. GLOSSARY

Combined Sewerage and Water System - a combined sewerage network where surface water runoff combines with waste water and may eventually reach watercourses via Combined Sewage Outlets.(CSOs)

Culvert - a covered channel or pipeline used to convey a watercourse under an obstruction.

Detention Pond - a basin constructed to store water temporarily to attenuate flows.

Drainage 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 (It may also be called a Drainage Impact Assessment).

Flood Prevention Measures - works including walls, new channels, embankments and flood water storage areas. Usually components of a flood prevention scheme.

Flood Prevention Scheme - a scheme of flood management measures under the Flood Prevention (Scotland) Act 2009 - see also SEPA and CIRIA definitions.

Flood Risk Assessment - an assessment carried out to predict and assess the probability of flooding for a particular site or area and recommend mitigation measures including maintenance. The 4 key risk receptors to consider are human health, economic activity, environment and cultural heritage.

Functional Flood Plain - areas of land which should be safeguarded from further development because of their function as flood water storage areas during times of heavy rainfall. This is normally defined as within the 1 in 200 year flood envelope.

Public Drainage System - the drainage systems which are the statutory responsibility of the roads and water authorities.

Sustainable Drainage Systems (SUDS) - a range of techniques for managing the flow of water run-off from a site by treating it on site and so reducing the loading on conventional piped drainage systems.

Watercourse - all means of conveying water except a water main or sewer (see s.55 of the Flood Risk Management (Scotland) Act 2009).



The economic costs of flooding can be significant.

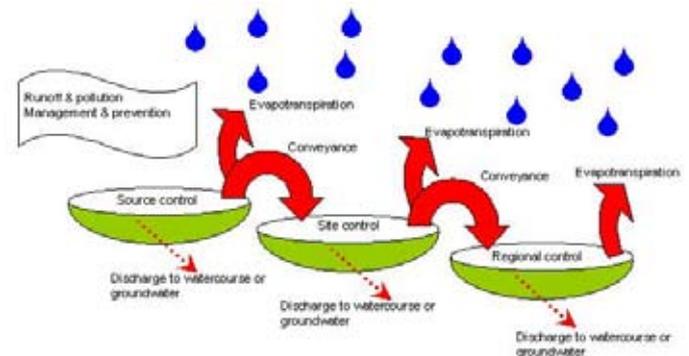
C. WHAT CAUSES FLOODING?

1. The natural causes of flooding fall into 3 main types:
a. Fluvial Flooding: - flooding from rivers, streams, and other natural or culverted watercourses. Caused when the capacity of the river channel or culvert is exceeded or flow blocked. Culvert obstructions and lack of maintenance may result in severe flooding over localised areas.

b. Pluvial Flooding: - Flooding caused by rainfall of varying intensity and duration where local topography or underlying ground conditions combine to prevent free effective drainage to a natural or man made drainage system or watercourse. Pluvial flooding is also affected by limited capacity of an existing natural surface water drainage network or network combined with man-made drainage systems to deal with significant water, or water and sewage discharges to the system.

c. Coastal Flooding. This is less relevant in North Lanarkshire due to its inland location. However if development increases flow discharges or peaks, then there can be a cumulative impact further downstream in areas of catchments more prone to coastal flood impacts.

2. The major non-natural cause of flooding is surface water run-off associated with urbanisation. Removal of top soil may also increase the rate of run off where the underlying inorganic soil is relatively impermeable (e.g. glacial till which is prevalent across the central belt of Scotland). Groundwater can be a potential source of flooding in some locations. Lack of maintenance, and the capacity of drainage infrastructure being exceeded can also potentially cause flooding. Potential infrastructure failure from canals and reservoirs should also be considered.



The management train - from CIRIA Guidance



Example of Sustainable Urban Drainage - A filtration trench which slows and removes pollutants from run-off

D. DEVELOPER REQUIREMENTS - FLOOD RISK ASSESSMENT

1. Many sites allocated for development will require to be subject to a Flood Risk Assessment, (FRA). As a guide, developers can use SEP's 1 in 200 Flood Map to determine whether their sites may be inappropriate for locating development or where more detailed consideration of flood risk should be considered. If assessed as having a low risk of flooding it will still require a Drainage Assessment (DA) as part of the information included in any subsequent planning application. (see 3.B) New development should connect to the public sewerage system in accordance with the EU Urban Waste Water Treatment Directive and SEPA policy on Provision of Waste Water Drainage in Settlements.

2. Where a potential risk of flooding is identified a FRA should accompany a planning application and be prepared by a suitably qualified consultant or company. This should demonstrate that the proposed development is in accordance with SPP and should be prepared in consultation with SEPA's Technical Flood Risk Guidance for Stakeholders, or any subsequent replacement guidance. In some cases rather than a Flood Risk Assessment, other information may be appropriate e.g. pre and post development site and finished floor levels related to nearby watercourses, appropriate photographs / or any nearby historical flood levels. If information is insufficient to provide a robust assessment of flood risk, a detailed, professionally prepared FRA may be necessary.

3. SEPA Flood Risk Mapping

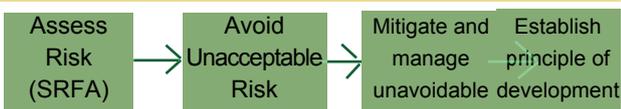
Developers should ensure that:

- the site is not located in or close to areas assessed as flood-prone
- development is not located where it will reduce flood storage elsewhere in the drainage catchment,
- water run-off from the development will not cause problems either upstream or downstream of a receiving watercourse.

4. SEPA's Indicative River and Coastal Flood Maps provides a national assessment of areas estimated to be at risk of flooding from rivers or the sea. The maps are intended to raise awareness and to encourage those potentially affected to take necessary steps to reduce the risk to themselves and their property. See: www.sepa.org.uk/flooding/mapping/about.htm for further information.



SEPA Provide a Flood Map which identifies general areas of risk but is not site specific.



4 SEPA: Achieving certainty; consideration of flood risk in development planning

5. Assessment against Risk Framework (SPP)

The Risk Framework, contained in the new SPP (para 204) indicates certain types of development are not appropriate in areas assessed as having different levels of flood risk. The framework categorises risk as follows:

1.	Little or no risk area: <0.1% annual probability (probability < 1:1000 year return period)
2.	Low to medium risk area: 0.1% to 0.5% annual (probability 1:1000 to 1:200 year return period)
3.	Medium to high risk areas: >0.5% annual (probability > 1:200 year return period)

Note that there may be sites that do not fall within the SEPA 1:200 year flood risk mapping process which may still be at risk of flooding e.g. small catchments less than 3 sq km.

6. Developers should seek further advice from the planning authority and SEPA for new development proposals identified within a flood risk / potential flood risk area. If the risk framework indicates that the proposed development type is inappropriate for the location it will generally be inappropriate to pursue the proposal further. For further information refer to "Drainage Assessment: A Guide for Scotland" - see Section I on p.11.

7. Self Certification: Drainage and Flood Risk

The council now requires drainage and flood risk self assessment to be submitted, ideally at the start of the application process or during pre-application discussions. If no information is provided, a view will be taken as to whether the lack of information or anticipated drainage / flood risk problems would result in a recommendation for refusal.

8. Types of assessment required under the following circumstances are listed below:

a. Drainage Assessment (Planning)

- Developments of 10 or more dwellinghouses or a lesser number if development may affect a sensitive area.
- Non residential new build developments or extensions with floorspace or hardstandings of 1,000 sq. m or over or a lesser development if it affects a sensitive area (i.e. a designated nature conservation area).

b. Flood Risk Statement

- as above, plus any lesser development deemed by the Council to require a flood risk submission i.e. due to the sensitivity of the development of the site.

c. Flood Risk Assessment

- Developments within a medium to high risk flooding area (SEPA 1:200 Flood Map).
- Developments close to a watercourse or open water.
- Developments on sites which have a history of flooding.
- Developments which will potentially lead to increased flood risk upstream or downstream.

9. Documentation Required

The following documentation will usually be required for Self Certification Drainage Assessments, Flood Risk Statements and Flood Risk Assessments:-

a. Drainage Assessment (at planning stage):

- Drainage Strategy (summary of the drainage system).
- List of SUDS features and their role in the SUDS system.
- Layout of the drainage system including, where relevant, the final discharge point.
- Background calculations including drainage parameters and attenuation calculations (in order to ensure that the pond / tank is large enough).
- Confirmation that extreme event out of apparatus drainage and flooding flows will not adversely affect existing or proposed buildings.
- Confirmation that the proposed drainage systems meet the latest SUDS guidelines from SEPA.
- Long term maintenance responsibilities for the drainage system.
- Confirmation, if deemed necessary by the Planning Authority, that foul drainage proposals are satisfactory to Scottish Water.
- Confirmation if deemed necessary by the Planning Authority, that surface water drainage proposals are satisfactory to SEPA or NLC Building Standards.

It must be certified by a chartered engineer or chartered architect that:

- **The surface water drainage system meets the principles of sustainable drainage (SUDS) as expressed through the latest SEPA guidance.**
- **foul drainage meets the requirements of Scottish Water (Sewers for Scotland 2nd Edition) plus SEPA or Building Standards as appropriate.**

b. Flood Risk Statement

A Flood Risk Statement is also required as to whether the proposed development is:

- within the SEPA medium to high risk flooding area
- within 20m of a watercourse or area of open water,
- on an area which has a history of flooding
- within a functioning flood plain

It must be certified by a Chartered Engineer or Chartered Architect or an applicant or agent with the note of sources of required information - that the submitted basic flood risk information is accurate.

c. Flood Risk Assessment

Necessary if triggered by any aspect of the Flood Risk Statement or otherwise required by the Planning Authority)

Assessment and any remedial measures in accordance with SEPA guidance.

It must be certified by a Chartered Engineer or Chartered Hydrologist experienced in flood assessment that the flood risk assessment is accurate and meets the requirements of SEPA guidance.

10. Applicants should note that membership of professional bodies may be checked. Any misinformation for personal or client benefit may lead to legal action against the person involved and could nullify any planning permission.

“It is incumbent upon prospective developers to take flood risk into account before committing themselves to a site or project, to undertake robust flood risk assessments and drainage assessments when required and to implement agreed measures to deal with flood risk”.

SEPA Position Statement 2009



Flood Prevention: A detention pond near Greenfaulds railway station, Cumbernauld

d. Undertake Flood Risk Assessment

11. Sites within already built up areas affected by the 1:200 year flood risk or greater as indicated on the SEPA Indicative Flood Map may still be suitable for residential, institutional, commercial or industrial development, provided flood protection measures to the appropriate standard already exist, are under construction or are planned as part of a long term development strategy within a Structure Plan context.

12. Sites affected by the 1:200 year flood risk or greater in undeveloped or sparsely developed areas will generally not be appropriate for development. Developments within the functional floodplain will only be permitted where a specific location is essential for operational reasons. If built development is permitted, measures to manage flood risk are likely to be required and the loss of flood storage capacity minimised. Water resistant materials and construction should be used where appropriate.

13. A Flood Risk Assessment (FRA) should be submitted as part of the planning permission in principle application for a proposed development. A further, more detailed FRA may be required when submitted the detailed planning application.

14. Developments within the functional floodplain will only be permitted where a specific location is essential for operational reasons. Such proposals should use flood resilient materials. Proposals in 'medium to high' flood risk areas should also use flood resilient materials and be designed in accordance with the new SPP. Planning authorities may decide that material type and form of construction are material planning considerations.

15. Flood Risk Assessment also need to consider possible flood risks from ground water, resevoirs dams, canals, culverts etc. Further guidance is contained within the new SPP and Building Standards Advice on Flooding. See also Annex B in SEPA Policy 41: “Development at Risk of Flooding, Advice and Consultation - A SEPA Planning Authority Protocol’ at www.sepa.org.uk/flooding/flood_risk.aspx

E. DEVELOPER REQUIREMENTS - DRAINAGE ASSESSMENT



1. Drainage Assessment

Drainage Assessments are different from Flood Risk Assessments. Their purpose is to assist regulatory bodies in assessing flood impact and drainage mitigation. (See Drainage Assessment: A Guide for Scotland (Section I, Sources of further guidance, p11)

2. Stages of Drainage Assessment

a) Drainage Assessment consists of a number of stages.

- Drainage Assessment should accompany submission of outline or detailed planning applications where surface or waste water requires to be drained.
- The level of information required will depend on the type of application, (outline or detailed), the scale and type of development, site conditions and sensitivity of the receiving catchment.

3. The Drainage Assessment will be used by the regulatory authorities to help assess the detailed drainage requirements and design of the development. Failure to demonstrate satisfactory measures for drainage of surface water or wastewater may be a reason for refusal of planning consent.

4. The Drainage Assessment should:

- address intended or predicted routes of surface water flows.
- ensure that run-off and discharge from the development do not adversely affect the sub-catchment drainage system
- demonstrate that surface water is drained according to sustainable urban drainage principles.
- include a section on wastewater drainage. which examines availability, location and capacity of public sewers and their ability to carry waste water from development.

5. All new developments should implement appropriate SUDS with the exception of discharges from single dwelling houses.



6

Culverting of burns and streams should be avoided as poor maintenance and blockages can lead to localised flooding.

6. Drainage Strategy

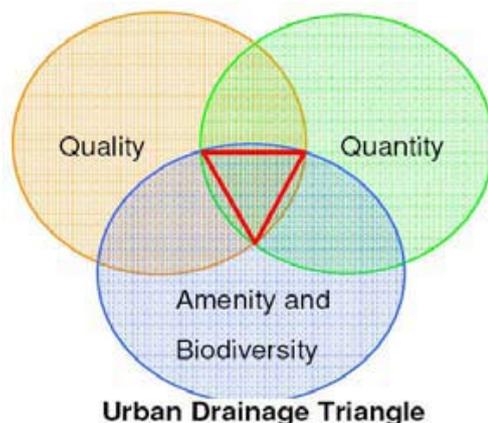
A Drainage Strategy should form part of the drainage assessment and should clearly outline the impact that the proposed development has in both surface water and foul drainage terms. The proposed means of foul water and surface water disposal from the site must demonstrate:

- a. the site can be developed without flood risk to the site itself;
- b. any land required to accommodate the proposed drainage facilities has been included;
- c. due consideration has been given to the impact of the proposed development on the drainage catchment area.

7. Local Plan Policy DSP.4 requires foul water drainage from new development to be connected to the public sewerage system. Small scale private systems will only be permitted where no acceptable alternative public system exists and where the system does not pose an environmental risk.



The use of porous paving and blocks can help rainwater drain away naturally saving significantly on underground pipework.



The environment can be enhanced through good drainage design.

7. Planning Permission In Principle Stage

At this stage the Drainage Assessment should include:

- Examination of current and historic drainage patterns within or adjacent to the site, including man-made features such as agricultural drainage and culverted watercourses
- Confirmation from the water authority of sufficient capacity within the sewer network to accommodate waste and surface water drainage from the development or a statement from the water authority of sewerage system constraints;
- Pre and post-development run-off calculations to provide an indication of surface water drainage requirements, treatment and storage solutions;
- An indication of the types of SUDS or other drainage systems to be used;
- Evidence of soil porosity, water table levels and the suitability of sustainable drainage systems to control run-off
- Consideration of surface water run-off and assessment of flood flow routes for events that exceed the capacity of the constructed drainage system; emergency flood routes through the site should be an integral part of the layout.
- Estimates of land required for sustainable drainage systems and storage solutions and their locations;
- The location and proximity of receiving storage solutions and watercourses and the drainage network capacity.

8. Detailed Planning Application

Detailed planning consent requires additional information:

- Detailed maps, plans and drawings of the drainage solutions for the development including SUDS treatment types, land requirements and final discharge points.
- Details of existing surface water drainage systems / roads drainage network and watercourse.
- Sustainable drainage measures relevant to the roads and drainage design;
- Detail of pollution treatment capability of SUDS and evidence that the level of treatment & available treatment volume fulfil water quality requirements.

9. The planning application must also consider and address the issue of ownership and long term maintenance of the proposed systems, therefore ensuring they function effectively across the lifetime of the development.



Green Roofs may help appropriate SUDS techniques for both commercial and residential buildings in slowing water run-off

10. Exceptions (to the need for a drainage strategy)

The only developments that might not require the submission of a drainage strategy are those, which, due to their size, have little if any impact in drainage terms. However the best option for waste and surface water drainage is still expected to be demonstrated by applicants. If in doubt contact the council to ascertain if a Drainage Assessment or Flood Risk Assessment is required.

11. Typical exceptions are:

- a. Developments with no existing drainage / flooding problems, along with no known capacity problems to connect or discharge into natural watercourses, land drains or surface water drainage systems.
 - b. Developments with a total proposed impermeable surface area of less than 1000 m² and developments, which are effectively a sub development of a larger development area for which a drainage impact assessment has already been submitted.
 - c. Developments of less than 10 new dwelling houses unless development may affect a sensitive area such as designated nature conservation sites;
 - d. Non-residential new build or extensions, with floor space or hardstanding less than 1,000sqm unless development may affect a sensitive area;
12. Developers should confirm with the planning authority whether the exemptions from Drainage Assessment may still require planning permission.

13. Planning Position if no Self-Certification is submitted?

If no Drainage Assessment is submitted then this may be, in itself, a reason for refusal. A judgement would be made on both the relative ground levels and on whether there is clearly enough amenity space within a development to accommodate SUDS provision. Where this is the case then it may be that a planning condition can be attached requiring that a certified Drainage Assessment be submitted for approval prior to works commencing. However, the Council needs to be confident that such SUDS provision can and will be provided. Should there be any doubt, the Council will err on the cautious side. The objective is to ensure that the rate and quantity of runoff to any watercourse or public sewer are no greater than the pre-development runoff. The drainage scheme must comply with the requirements of the publication titled: 'Drainage Assessment: A Guide for Scotland' and any other advice subsequently published by SEPA.



SUDS can also add to the value and amenity of schemes 7

F. SUDS - DESIGN & TYPES OF SUSTAINABLE DRAINAGE

Sustainable Urban Drainage Systems (SUDS)

SUDS

1. Traditional drainage systems in urban areas used pipes and drains to prevent flooding by directing large quantities of surface water away from the area as quickly as possible. This alteration of natural flows led to:
 - increased numbers of peak discharges from sites
 - problems of increased volumes of water within those peaks.
 - adverse water quality from pollutants from urban areas washed into rivers or the groundwater.
2. Conventional drainage systems also tended to ignore the potential amenity associated with watercourse drainage systems such as ponds, streams, and creation of wildlife habitats as part of the drainage system.
3. SUDS should improve the water quality of drainage. Additionally, SUDS can help prevent flooding by attenuating surface water flows from new development and add to amenity, environmental quality and biodiversity. Too often SUDS can be seen in isolation as an extra cost, when integrated properly they can add value with views and an attractive setting.
4. Under the Controlled Activities Regulations, regulated by SEPA, SUDS are now required for almost all new development.
5. SEPA promotes SUDS to achieve a balance between water quality, water quantity and amenity value (see diagram on page 6). SEPA also support their use for the additional reasons of controlling peak flows, reducing loading to combined sewerage and water outlets (CSOs) and to mitigate the risk of flooding by reducing the rate and volume of surface water runoff.
6. Sustainable Urban Drainage Systems (SUDS) are more sustainable than conventional drainage methods because they:
 - Slow runoff rates from sites, reducing flood impact on urban areas
 - Protect water quality by filtering out sediments and pollutants
 - Provide landscape features and habitats for wildlife in urban settings.
7. This is achieved by:
 - Dealing with runoff close to where the rain falls
 - Delaying flow to watercourses thus reducing peak discharges entering watercourses at times of heavy rainfall thus reducing flood risk.
 - Managing potential pollution close to its source and prior to it reaching significant watercourses.
8. SUDS Objectives are therefore to:
 - Minimise impacts from development on the quantity and quality of the runoff.
 - maximise amenity and biodiversity opportunities.
9. The aims should be to incorporate all of these benefits although the degree to which this is achievable will depend on site characteristics. SUDS design should aim to reduce runoff by integrating different control methods at locations throughout the site. Effective control of runoff at source will reduce the need for large scale flow attenuation and flow control structures. Note that SUDS are applicable to contaminated sites and developers should contact the planning authority, Scottish Water, and SEPA to discuss treatment options.

SUDS Management Train

11. To recreate the natural drainage processes as closely as possible, a “management train” is required. This approach uses a sequence of drainage techniques to incrementally reduce flow rates and volumes, and pollution.
12. In developing the management train it is necessary to implement a logical process of key steps. ie
 - 1. Prevention** - use good site design to reduce runoff:
 - Rainwater storage & reuse, water butts etc.
 - Prevention policies included within the site design plan and proposed management regime.
 - Low maintenance and management measure are preferred.
 - 2. Source control** - control of runoff at or near source:
 - Soak-aways,
 - other infiltration methods,
 - permeable pavements.
 - 3. Site control** Management of water over a larger area
 - directing surface water runoff to a larger soak-away, infiltration or detention basin.
 - anticipating direction of overland water flow routes within the site
 - providing gaps between housing as necessary to allow flows to be channelled to infiltration or detention measures.
 - 4. Area control** - management of runoff from a site or several sites, typically to a detention/attenuation pond or wetland.
13. Where possible, at the area control level, runoff should be managed in small, cost effective landscape features located within small sub-catchments rather than being conveyed to and managed in large systems at the bottom of drainage areas (end of pipe solutions).
14. Techniques at the start of the management train are preferred to those further down so that prevention and control of water at source should always be considered before site or area levels of control.
15. Where source control options are limited, larger scale options should be used in series. A prime objective is to deal with the runoff on site. Smaller developments may only need to consider source control whereas large developments may need further levels of control.
16. Site and area control can have significant implications for site layout and may require parts of the site to be set aside for SUDS. Flow of water between individual parts of the management train should use above-ground conveyance systems (e.g: swales and filter trenches) wherever possible -although pipe work and sub-surface trenches may sometimes be required.
17. Regular maintenance and sediment removal are vital to ensure long term effectiveness of SUDS techniques.
18. Developers should discuss proposed measures early in the application process with the Council, Scottish Water and SEPA. The variety of design options available allows planners and developers to consider local land use, land take, future management scenarios and the need of local people when undertaking the drainage design.



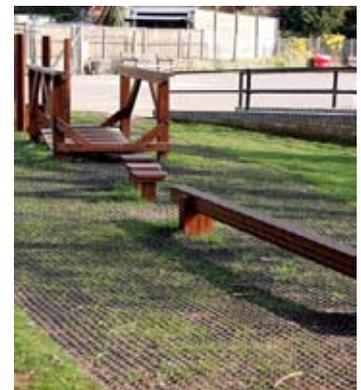
Purpose designed permeable paving slows runoff.



Water butts can aid flood prevention by source control



Paved surfaces should be avoided unless permeable



Permeable surfaces should be considered for playgrounds

18. Range of SUDS Techniques

There are many ways to be sustainable:

● **Water Butts** - These are storage barrels normally collecting water from roofed areas. The Council will encourage developers to install these however householders may also do so. Water gathered can be used for gardens etc during dry periods.

● **Swales** - Broad, shallow channels covered by grass or other suitable vegetation. Swales attenuate the surface water flow and allow time for filtration and sedimentation into sub-surface soil in areas where soil porosity is suitable.

● **Filter Strips** - These are wide, gently sloping areas of grass or other dense vegetation that slow and treat runoff from adjacent impermeable areas.

● **Filter Drains**- Filter drains are trenches that are filled with permeable material such as gravel. They work by providing capacity for attenuation. Surface water from paved areas flows into the trenches, is filtered and conveyed to other parts of the site. A perforated pipe may be built into the base of the trench to collect and convey the water.

● **Infiltration Devices** - Dispose of surface water runoff into the ground. Both ground water and ground conditions have to be suitable to receive the volume and quality of water anticipated.

● **Permeable Surfaces** - allow rainwater to pass through the surface into an underlying storage layer, where water is stored before infiltration into the ground. They can be designed to fit in with a variety of settings eg. Permeable paving or gravel surfaces in car parks. Garden paths (nb. Permeable surfaces are not currently suitable for adoptable roads)

● **Infiltration Basins** - Depressions created within the site to store runoff and allow filtration into the ground below.



Green walls can reduce heat gain by shading

Reducing Water Usage...

- Use showers in place of baths
- Use spray taps
- Use dual flush toilets
- Store and reuse rainwater
- Only heat what water you need (don't fill the kettle)

... also reduces water bills

see www.waterwise.org.uk and

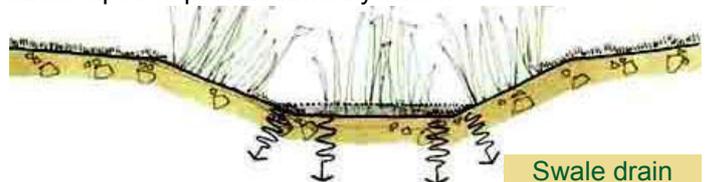
www.defra.gov.uk/environmental/quality/water/conserves/what.htm

● **Extended Detention Basins** - These are normally dry, though they may have small permanent pools at the inlet and outlet. They are designed to detain a larger runoff volumes than infiltration basins as well as providing water quality treatment.

● **Ponds and Pools** - Small but permanent water bodies which provide temporary storage for additional storm runoff above normally expected water levels. Wet ponds may provide amenity and wildlife benefits and a sedimentation process to reduce pollution to watercourses. Water may be retained for as long as 2 or 3 weeks.

● **Trees and shrubs** - these can absorb significant levels of runoff as part of their lifecycle processes. (Evapotranspiration).

● **Constructed Wetlands** These are ponds with shallow areas and wetland vegetation to improve pollutant removal and enhance wildlife habitat. They may also be landscaped to provide amenity value.



Swale drain

● **Green Roofs** Systems which cover a building's roof (or walls) with vegetation. They are laid over a drainage layer, with other layers providing protection, waterproofing and insulation. Sedum rather than grass can minimise maintenance. See <http://livingroofs.org>

● **Blocked culverts** are a major source of localised flooding. Returning culverts to open channels reduces incidences of blockages and can benefit wildlife and amenity.

● **Below Ground Storage** enables retention of water for irrigation of green infrastructure.

G. MAINTENANCE FACTORING & ADOPTION

1. Maintenance

Maintenance of proposed new drainage infrastructure and SUDS is an important consideration. Inappropriate or deficient maintenance can result in failure of the drainage system and resultant flooding and pollution of the environment. Surface water discharge and constraints to the sewerage systems are significant drainage issues in some areas of North Lanarkshire. During periods of significant rainfall, surface water sewers may currently have insufficient drainage capacity to cope with water volumes resulting in polluted water not being contained.

2. Where a sewer is not available the developer should contact Scottish Water regarding the possibility of providing a public sewer to carry wastewater to an existing wastewater treatment plant; otherwise the developer may have to provide the infrastructure for adoption by Scottish Water potentially including Waste Water Treatment facilities. Generally,, Scottish Water will not permit wastewater to be pumped to a public sewer unless a gravity system has been proved unfeasible.

3. In some areas potential pollution issues are increased by the prevalence of the combined sewerage network where surface water runoff combines with waste water. This can place a significant burden on waste water treatment works and may increase the risk of flooding. It is now common practice to provide separate systems for foul and surface water. The foul water is piped to the waste water treatment works whilst surface water is piped to the nearest watercourse. However, many older networks have yet to incorporate separate drainage systems. Para.47 of Planning Advice Note 79 Water and Drainage also advises it is best practice to separate foul from surface water drainage.

d) If private drainage arrangements are proposed, the developer should consult with SEPA in relation to authorisation of discharge(s) of sewage effluent to land or controlled waters. The SEPA website also provides advice and guidance regarding the design of Sustainable Urban Drainage Systems. (www.sepa.org.uk)

5. Responsibility for SUDS

Maintenance of Sustainable Drainage Systems is essential if they are to perform properly and not pose a risk of flooding themselves. However the responsibility for maintenance of SUDS is often complex - as described below:

A: Within property boundaries

SUDS Maintenance within property boundaries is the responsibility of the property owner. This includes many types of source control techniques. Developers should make owners aware of their responsibility and should investigate setting up factoring agreements to manage the maintenance of such SUDS.

B: SUDS outside property boundaries

Sections 29, 30 and 33 of the Water Environment & Water Services (Scotland) Act 2003 amend the Sewerage Scotland Act 1968 to allow connection to and adoption of SUDS by Scottish Water. Sewers for Scotland 2nd Edition (SfS2) specifies Scottish Water's requirements for adoption of SUDS systems.

6. Adoption - by Scottish Water or others

The most effective way to implement surface water management for developments may be through agreements between local authorities and Scottish Water. Section 7 of the Sewerage Scotland Act 1968 has provision for Scottish Water to enter agreement with the Roads Authority to allow the use of their sewers for the conveyance of water from the surface of a road or to allow the use of road drains for the conveyance of surface water from premises. A section 7 Agreement will generally contain the terms for a single authority wide agreement between Scottish Water and each Road Authority. Individual developments should have an associated schedule which will contain site specific details of the ownership and maintenance arrangement for the entire development drainage system.

7. Scottish Water will now adopt detention ponds, basins and underground storage structures of adoptable specification, (as defined by SfS2).. Scottish Water has no responsibility for SUDS within property boundaries and consequently the public SUDS to be adopted will generally have to be located in public open space.

8. SfS2 explains Scottish Water's specific requirements and provides detailed design guidance on pond and basin configuration and underground storage systems. Details of dimensions required, locational considerations, inlet and outlet structures are provided. SUDS for Roads provides details of adoption processes for SUDS features associated with new roads - including the possibility of combining road SUDS with general SUDS for the development.

9. There are certain types of SUDS which Scottish Water will not adopt e.g. filter trenches, swales & porous paving. These SUDS mechanisms should not be ignored however, as they offer a number of flood prevention, water quality, biodiversity and amenity benefits.

10. Early discussion between developers, the Council, Scottish Water and SEPA should be initiated when designing SUDS for a development. The Council may adopt some SUDS features which Scottish Water will not adopt. However this will be assessed on a case-by-case basis. In such instances an agreement to provide a commuted sum towards the cost of maintenance would be expected from developers before planning permission was granted.



Avoiding fencing creates a more natural appearance and can add amenity value. Shallow edges help ensure that safety requirements are met.

H. NATURE CONSERVATION

1. North Lanarkshire Council has a duty under Section 1 of the Nature Conservation (Scotland) Act 2004 to further the conservation of biodiversity. The Council therefore seeks to encourage above ground SUDS, where possible. SUDS schemes offer opportunities to contribute to the protection and enhancement of biodiversity by incorporating measures into their design to create new or improved habitats for species. SUDS schemes should therefore aim to maximise their biodiversity potential. Details of measures to protect and enhance biodiversity and of relevant legislation about protected species and habitats is contained in SPG 20: Biodiversity and Development.

2. Initial development and drainage proposals for the site may need to be altered to allow mitigation measures for protected species. These mitigation measures should be incorporated into the detailed design of the development and drainage system. Pre-development surveys for protected species should be implemented and the results used to make an assessment of impact on species and habitat. Scottish Water do not currently have any responsibility for the element of SUDS schemes which encourage landscape and habitat creation or improvement. Therefore responsibility for future management should be clarified at the outset. Chapter 7 of SEPA's Ponds, Pools and Lochans good practice guide on Maximising the Ecological Value of Sustainable Urban Drainage Systems provides useful guidance regarding incorporating biodiversity into SUDS.

I. FURTHER GUIDANCE

Relevant Organisations

Scottish Environment Protection Agency:

www.sepa.org.uk - see their Guidance Notes: 9 on consultation with SEPA & Position Statement on Planning and Flooding (July 2009)

Scottish Government

www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/

Scottish Natural Heritage www.snh.org.uk

Scottish Water www.scottishwater.co.uk

Legislation

Flood Risk Management (Scotland) Act (2009) - with biennial reports

Roads Scotland Act 1984 (As amended).

Town and Country Planning (Scotland) Act 1997

The Water Environment and Water Services (Scotland) Act 2003.

The Water Environment (Controlled Activities) (Scotland) Regulations as amended

Consult the SEPA Guidance on SUDS and Drainage Assessment – A Guide For Scotland and Flooding Maps at www.sepa.org.uk/flooding/mapping/about.htm

Also Sustainable Urban Drainage System advice notes on – Setting the Scene In Scotland, Brownfield Sites, Do's and Don'ts Guide and on Drainage Assessment from: www.sepa.org.uk/flooding.aspx or

www.sepa.org.uk/water/water_publications/suds.aspx and their River Basin Management Plans.

Technical Flood Risk Guidance for Stakeholders can be found at www.sepa.org.uk/flooding/flood_risk/planning_flooding.aspx

Planning Guidance

Scottish Planning Policy SPP7 "Planning and Flooding".

Planning Advice Notes:

PAN 61: Planning and Sustainable Urban Drainage Systems

PAN 69: Planning and Building Standards: Advice On Flooding.

PAN 79: Water and Drainage.

all at www.scotland.gov.uk/Topics/Built-Environment/planning/publications/pans

see also www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/flooding and www.cabe.org.uk/sustainable-places/advice/integrated-suds

Other Guidance

Ponds, Pools and Lochans : Guidance on Good Practice In the Management and Creation of Small Water Bodies In Scotland

Watercourses in the Community – A Guide to Sustainable Watercourse Management in the Urban Environment

www.sepa.org.uk/water/water_regulation/regimes/engineering/habitat_enhancement/best_practice_guidance.aspx

The SUDS Manual C697 and **Site Handbook for the Construction of SUDS C698** (2007), download from CIRIA - www.ciria.org.uk

SUDS for Roads (2010) - see link from www.sepa.org.uk/water/water_regulation/regimes/pollution_control/suds.aspx to SCOTS sharepoint site

See also www.paving.org.uk/permeable.php and www.waterwise.org.uk



Swales are shallow vegetated channels designed to convey road runoff and treat pollutants (from Scots "SUDS for Roads")

J. Checklist *your scheme should ensure*

The Council will expect all applications for larger schemes (as part of the Design Statement) to provide the following information:-

- Evidence that all the appropriate agencies have been involved? (p.2)
- Is a Flood Risk Assessment required? (p.4)
- Has a Flood Risk Assessment been submitted where required? (p.4 and 5)
- Is a Drainage Assessment required? (p.6)
- Does the Drainage Assessment address the points on p.6 and 7?
- Does the development minimise the use of water required? (p.7)
- Is there a SUDS strategy? (p.8-9) Are appropriate SUDS methods being used?
- Has the management strategy been identified? Are there areas to be adopted?
- Are the works being undertaken to adoptable standards? (p.10) Are any factoring arrangements set out?

The latest Supplementary Planning Guidance and index can be found online at:- www.northlanarkshire.gov.uk/spg

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www.sepa.org.uk

Scottish Natural Heritage
30 Hope Street, Lanark, ML11 7NE
T: 01555 665928 www.snh.gov.uk
E: enquiries@snh.gov.uk
www.snh.org.uk/pdfs/publications/heritagemanagement/EIA.pdf

Scottish Water
Castle House, 6 Castle Drive,
Carnegie Campus
Dunfermline KY11 8GG
T: 0845 601 8855
www.scottishwater.co.uk

Scottish Government
See also advice at:
www.scotland.gov.uk/topics/planning

This is one of a series of Supplementary Planning Guidance Leaflets aimed at encouraging good practice in the design and layout of new development. The advice supplements the policies in the emerging North Lanarkshire Local Plan. The Council will have regard to this Guidance when assessing the merits of planning applications. This leaflet has, following public consultation and consideration of all comments made, been formally approved as Supplementary Planning Guidance. It is available on-line can be translated or provided in other languages or formats on request

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