

Sustainable drainage systems

What are sustainable drainage systems and why are they important?

Sustainable drainage systems (or SuDS) are designed to control surface water runoff close to where it falls, combining a mixture of built and nature-based techniques to mimic natural drainage as closely as possible, and accounting for the predicted impacts of climate change. They provide benefits for water quantity, water quality, biodiversity and amenity. Many types of sustainable drainage systems are possible, contributing to reducing the causes and impacts of flooding. Multifunctional sustainable drainage systems are those that deliver a wider range of additional biodiversity and environmental net gains such as to:

- ameliorate urban heating and air pollution;
- replenish groundwater resources;
- contribute to biodiversity net gain targets;
- capture and re-use rainwater;
- store carbon;
- reduce the need for carbon-intensive construction techniques and pumped systems;
- release capacity in combined sewerage systems and at wastewater treatment works;
- create and connect valuable areas of blue-green infrastructure
- reduce lifetime maintenance costs; and
- enhance the attractiveness and value of new development by integrating water management with habitat for wildlife and opportunities for amenity and recreation.

The layout and function of drainage systems needs to be considered at the start of the design process for new development, as integration with road networks and other infrastructure can maximise the availability of developable land.

Guidance on the planning considerations on sustainable drainage needs to be read in conjunction with guidance related to:

- [water quality](#)
- [what to think about if there are concerns about water supply/quality?](#)

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What sort of sustainable drainage systems can be considered?

The types of sustainable drainage system which it may be appropriate to consider, will depend on the proposed development and its location, as well as any planning policies and guidance that apply locally. Where possible, preference should be given to multi-functional sustainable drainage systems, and to solutions that allow surface water to be discharged according to the following hierarchy of drainage options:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

Particular types of sustainable drainage features may not be practicable or appropriate in some locations, such as the use of infiltration techniques from potentially polluting development in areas where groundwater provides a potable supply of water (e.g. [Groundwater Source Protection Zone 1](#)). Local planning authorities may find it helpful to set out those local situations where they anticipate particular sustainable drainage features:

- being inappropriate; or
- delivering the greatest benefits.

Local planning authorities may wish to encourage the incorporation of rainwater harvesting in sustainable drainage systems. Such systems are likely to be most appropriate for larger commercial or industrial applications and/or for development in areas with a current or likely future [Water Stressed Area Classification](#). Refer to [Water Efficiency Standards](#) and consider such features as part of a [Water Cycle Study](#).

Consideration of sustainable drainage systems early in the design process for development, including at the pre-application or master-planning stages, can lead to better integration, multi-functional benefits and reduced land-take.

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Where can advice be obtained on surface water drainage?

When considering major development with surface water drainage the local planning authority must [consult the lead local flood authority](#) on proposed drainage arrangements. For other developments, particularly in areas at risk of flooding, the local planning authority should consider the circumstances where it would be beneficial to [seek advice from the lead local flood authority](#). Local planning authorities are also advised to consult as appropriate:

1. The relevant sewerage undertaker where adoption by the undertaker or a connection with a public sewer is proposed.
2. The Environment Agency, in [areas with critical drainage problems](#) (for non-major and major development in Flood Zone 1 consultation is a legal requirement if the Local Planning Authority receives notification from the Environment Agency).
3. The relevant highway authority for an affected road.
4. The Canal and River Trust, if the drainage system may directly or indirectly involve the discharge of water into or under a waterway managed by them.
5. An internal drainage board, if the drainage system may directly or indirectly involve the discharge of water into an ordinary watercourse (within the meaning of [section 72 of the Land Drainage Act 1991](#)) within the board's district.

Non-statutory [technical standards](#) are available to guide decisions about the design, maintenance and operation of sustainable drainage systems. Refer to the [Environment Agency's approach to groundwater protection](#). Detailed industry guidance (for example CIRIA's [SuDS Manual](#), the Institution of Civil Engineers' [SuDS Route Maps](#), provide technical details for the suitability of sustainable drainage systems for a wide range of design characteristics.

Applicants and developers should take into consideration the above.

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Are there particular factors the local planning authority will need to address when considering a sustainable drainage system as part of a planning application?

The local planning authority should be satisfied that the minimum standards of operation for the proposed sustainable drainage system are appropriate, and that there are clear maintenance and adoption arrangements in place for the lifetime of the development. The local planning authority will need to consider whether the proposed standard of construction would facilitate adoption and maintenance by an appropriate body such as the water and sewerage company under the Ofwat-approved [Sewerage Sector Guidance](#). Also refer to the non-statutory [technical standards](#).

The use of monitoring and operation technology as part of sustainable drainage systems could help to optimise their effectiveness and allow their operation to be adapted over time.

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What information on sustainable drainage needs to be submitted with a planning application?

Where SuDS are required in accordance with paragraphs 167 and 169 of the National Planning Policy Framework, to reduce delays in the planning process, applicants need to submit a sustainable drainage strategy containing proportionate information on the proposed sustainable drainage systems as part of their planning application (including outline applications), having regard to the nature and scale of the development proposed. Where a site-specific flood risk assessment is required, it may be appropriate to combine the two. Local planning authorities should consider setting out requirements for supporting information on sustainable drainage systems as part of their [local list of information requirements](#).

Supporting information will need to describe the existing and proposed surface water management arrangements to ensure there is no increase in flood risk to others off-site. It may need to address:

1. What are the existing surface water drainage arrangements for the site?
2. If known, what (approximately) are the existing rates and volumes of surface water run-off generated by the site?
3. What are the proposals for managing and discharging surface water from the site using sustainable drainage systems and accounting for the predicted impacts of climate change? What are the proposals for restricting discharge rates?
4. Demonstrate how the hierarchy of drainage options has been followed. Explain and justify why the types of sustainable drainage systems and method of discharge have been selected and why they are considered appropriate. Where sustainable drainage systems are considered to be inappropriate, provide clear evidence to justify this. Where cost is a reason for not including sustainable drainage systems, provide information to enable comparison with the lifetime costs of a conventional public sewer connection.
5. How have sustainable drainage systems been integrated with other aspects of the development such as open space or green infrastructure, so as to ensure an efficient use of the site?
6. What multifunctional benefits will the sustainable drainage system provide? For major developments, if multifunctional sustainable drainage systems are not being provided, what evidence is there that such techniques are not possible?
7. What opportunities to reduce the causes and impacts of flooding have been identified and included as part of the proposed sustainable drainage system?
8. How will run-off from the completed development be prevented from causing an impact elsewhere?
9. How has the sustainable drainage system been designed to facilitate maintenance and, where relevant, adoption? What are the plans for

ensuring an acceptable standard of operation and maintenance throughout the lifetime of the development?

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What considerations apply to the adoption of sustainable drainage systems?

Proposals for Sustainable Drainage Systems should include arrangements for their long-term maintenance. Possible arrangements could include (but are not limited to) adoption by:

- a water and sewerage company
- the local authority
- the lead local flood authority
- a community trust
- a private management company

Adoption bodies may have their own specific approval criteria and protocols in place for sustainable drainage systems that need to be satisfied prior to any adoption or maintenance agreement being taken forward. These will need to be examined early in the design process to ensure any such criteria are clearly understood by the applicant.

[Section 104 of the Water Industry Act 1991](#) allows for water and sewerage companies to adopt drainage assets that fall within the legal meaning of a sewer (including sewage disposal works) or lateral drain. Some sustainable drainage systems can therefore be considered adoptable by the relevant water and sewerage company. In considering such an adoption route, applicants are advised to consult with the appropriate water and sewerage company at the earliest opportunity, ideally at the design stage of the development. The water and sewerage company is likely to want to see full details of a sustainable drainage system proposed for adoption as part of any Section 104 application. The Ofwat-approved [Sewerage Sector Guidance](#) sets out those design and construction standards that need to be met in order for qualifying features to be adopted by the relevant water and sewerage company.

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Are other permits needed for sustainable drainage systems?

In some cases, a separate permission may be needed for sustainable drainage systems that release polluting liquids:

- to surface water such as rivers or streams
- directly or indirectly to water underground

Check if an Environmental Permit is needed from the Environment Agency by visiting [Check if you need an environmental permit](#). In many cases, an Environmental Permit will not be needed. [Check when you do not need a permit](#).

If a sustainable drainage system involves works on or near a river, flood defence or sea defence, a separate permission may be required. See [Proximity to watercourses and need for a flood risk activity permit](#).

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