

Q&A on Sustainable Urban Drainage Systems

In Scotland, as part of the enabling legislation relating to the Water Framework Directive, the term 'sewer' was redefined to include SUDS components. Through this, Scottish Water was made responsible for the future maintenance and capital replacement of shared public SUDS through the enactment of Stage 3 of the Water Environment and Water Services (Scotland) Act 2003. (WEWS).

Scottish water is currently editing the sewers for Scotland manual to include the design and construction standards of those systems that will become public SUDS

Below are the answers to the most frequent questions we have been asked to address.

Policy

Q: *If the Developer wishes to provide private drainage then why does it need to be constructed to Sewers for Scotland 2 (SfS2) even though it would be connected to the public sewerage system?*

A: Once connected and taken over by Scottish Water the system becomes part of the public drainage system and should be of a consistently good standard, known to those who will work on it in future. It is a reasonable condition within Section 12(3) of the Sewerage Scotland Act. Even if that part of the drainage remains private the integrity of the public system must be maintained. A badly designed system connected to the public drainage could damage the receiving sewers for example by conveying too much silt or causing blockages downstream.

Q *Why is it the responsibility of the developer to arrange for the provision for the disposal of Roads drainage?*

SW is not responsible for road drainage and it is up to the developer to ensure the appropriate routes are perused for a body to be responsible - either the Local Authority (LA) or SW (via a section 7 agreement) or for it to remain with the developer.

Q: *Where a surface water system is made up of parts which comply with the technical manual and parts that do not comply, will SW take over the compliant parts?*

A: SW will not take over parts of sewers connected to other parts which are not built to the appropriate standard as this could impact on the operation and integrity of the rest of the system. Scottish Water is currently examining the details of taking over existing and legacy SUD systems through an independent review which will assess their compliance with the SfS2 and their operational effectiveness. This process will help existing systems move towards public ownership.

Q: *Why does SW only intend to take over detention ponds, detention basins and underground storage?*

In order to help identify future funding requirements and to gain a greater understanding of the implementation and long-term operation of SUD systems, the water industry used the results of the latest research in the field of sustainable urban drainage to assess costs and performance of SUDS. The research highlighted those SUD systems where the long term operational costs and performance have been proven. Scottish Water is the drainage authority and has responsibilities for only part of the whole SUDS concept.

Q: *Why are developers encouraged to use systems other than the ones in the manual when SW will not be taking them over?*

The amendment to Sewerage Scotland Act to include SUDS was not intended to make Scottish Water responsible for all elements of the SUDS treatment train. Scottish Water is the drainage authority and has responsibilities for only part of the whole SUDS concept. The surface water flow from developments and how it is treated is a responsibility for all stakeholders.

To incorporate the full SUDS concept local authorities must be encouraged to deal with the run-off from roads appropriately by providing attenuation and treatment before the water reaches the public sewer.

Developers too must consider ways to reduce surface water run-off and integrate sustainable features throughout their schemes.

The surface water flow from developments and how it is treated is a responsibility for all stakeholders.

The option for SW to enter into site specific agreements for systems not meeting our standards exists but we will reserve the right to set what we deem to be the most appropriate conditions.

Q: *Small sites, especially brownfield sites, have limited availability to allocate land for a pond or basin. Can other solutions be used?*

SW understands that this can be an issue and is working with SEPA (Scottish Environment Protection Agency) to develop guidance which will allow small sites to use alternative systems, such as proprietary products, while ensuring the protection of the water environment. Any decision will be communicated to the development sector and other interested parties.

Q: *Why do public SUDS have to be located in public open spaces?*

Scottish Water must have access to the public SUDS at all times for both planned and unplanned maintenance.

Q: *Why do SUDS have to be de-silted before they can be taken over by SW?*

During the construction phase of a development large amounts of sediment will enter the system and impact on its effectiveness. Prior to SW accepting any assets they require the systems to be in a fit state for take over and fully operational. The de-silting of a SUDS system before take over is equivalent to ensuring a pipe system is free of debris before take over. This is part of the reinstatement process as recommended on the forthcoming SUDS manual developed by CIRIA

Q: *Why is SW excluding infiltration trenches and swales from the type of SUDS it is willing to take over?*

With regard to end of pipe infiltration trenches all evidence to date indicates that these have a high failure rate compared to detention basins and ponds. Infiltration trenches dealing with runoff at source have been shown to be much more effective. This would however be placed within the curtilage of buildings, therefore will be the responsibility of the owner/occupier. Trenches used to treat road runoff will remain the responsibility of the roads authorities with whom SW will be able to enter into agreement under the provisions of section 7 of the Sewerage Scotland Act

Discussions during the scoping of the Sewers for Scotland 2 document very clearly reached the conclusion that Swales were excluded on the basis that they were largely provisions for roads drainage and not for domestic stormwater run-off. In fact it was pointed out that the normal depths of a Swale at around 400 mm was insufficient to enable domestic stormwater run-off to be piped into it.

Q: *Why does SW require fences to be provided around ponds?*

A: SW has consulted extensively with the Health and Safety Executive (HSE) in this regard. HSE consider SUDS to be a working SW asset no different from a pumping station or waste water treatment works. As with all other workplaces, SUD systems' design standards must ensure compliance with section 3 of the Health and Safety at Work Act.

Q: *What does CAR¹ mean and where does it apply?*

The Controlled Activities Regulation (CAR) came into force on the 1st of April 2006. CAR regulates all activities which are likely to have an impact on the water environment including discharges, abstraction and impoundments and engineering activities. Drainage and discharging of surface water is regulated under General Binding Rule 10 (GBR10) which requires runoff from all sites built after the 1st April 2006 to be drained via a SUD system.

This applies whether the discharge is made directly into the water environment or indirectly through an existing Surface Water Sewer. The only two occasions GBR10 does not apply is where the drainage is from a single building or the discharge is to coastal waters.

More information on the Controlled Activities Regulation can be found on the SEPA website (www.sepa.org.uk)

Technical

Q: *In which circumstances will SW take over SUD systems designed to treat over 1 Vt or systems outwith the ones specified in the manual?*

Industrial/commercial developments are likely to have a higher pollutant loading therefore they may require a higher level of treatment. In these situations and where the standard components are not acceptable, the design of the public SUDS will be agreed on a case by case basis and with SEPA's agreement.

Q: *Why do developers have to use the "greenfield" runoff calculation in Appendix XI when he may have the opportunity to use the most suitable criteria for calculation?*

The general principles of river basin management are aimed at reverting to the natural flow and this principle is therefore appropriate and follows general CIRIA guidance on calculating runoff. We have utilised a recognised simplified method which can be used as a rule of thumb but is a maximum run-off rate. Other more detailed methods may be used to reduce the run-off rate.

Q: *Why does SW encourage the development of several ponds in series?*

Several ponds in series compared to a single large pond, provides hydraulic, water quality and ecological benefits. However SW understands that the topography or land take may not allow this in every case.

Q: *The manual states a need for a 10% allowance for increase in paved areas within a catchment and 10% for climate change. How can these figures be substantiated?*

These recommendations have come from HR Wallingford, the industry experts in terms of hydraulic requirements of sewerage systems. Compared to the UK Climate Change Impact Programme model 10% is probably a very conservative estimate.

¹ (Water Environment (Controlled Activities) (Scotland) Regulation 2005)

Q: *Why is there a requirement for a 3.5 m maintenance access route around SUDS ponds?*

A: The development of SW SUDS standard was based on results of latest research in the field of sustainable urban drainage and best industry practice in the UK and ensures the systems will operate efficiently and appropriately. The 3.5m route will allow our maintenance vehicles to gain access to all areas and follows industry best practice.

Q: *Can inlet structure incorporate sump for silt build up?*

A: No. This would cause problems for draining down and incur high maintenance costs in terms of regular monitoring / emptying. The sedimentation forebay is where silt should be retained and removed.

Q: *Will the Developer be given the opportunity to use alternative arrangements to concrete forebays, e.g. Reno Mattress?*

A: Concrete is required to provide a firm base for the access of sediment removal equipment e.g. mini excavator, dumper truck. Concrete base will provide safe access and minimise risk of damage. Alternative arrangements in exceptional circumstances may be discussed on a site by site basis.

Q: *Why are drawdown details required for every pond?*

The alternative of pumping will impose additional expense in terms of the operation and management of the asset. In exceptional circumstances alternatives may be discussed.

Q: *Which kind of prefabricated structures will SW consider as being appropriate for take over?*

A: Currently only prefabricated underground storage structures such as storage tanks will be taken over by SW. However we are investigating the possibility of taking over proprietary products (such as Aquacells, Stormcells and Downstream Defenders). Any decision will be communicated to the development sector and other interested parties.

Q: *Can Geocellular systems (such as storcell, aquacell etc.) be used instead of conventional SUDS systems?*

A: Geocellular systems are not considered to provide any level of treatment therefore they will only be acceptable where:

1. The new surface water system will discharge into the combined sewers system.
2. Where the surface water is discharged into a Surface water drainage system or directly into a receiving water body and enough water quality treatment is provided at source (for example through the use of porous pavements and road swales) but attenuation is still required. SEPA must agree the level of treatment provided is sufficient before SW will accept the system.

In both cases during the construction stage the geocellular system must be protected from silt and sediments through the use of a suitable screen or template silt trap.

Any additional question can be answered by our Planning and Development services team

Glossary

CIRIA: The Construction Industry Research and Information Association was founded in 1960 and works in conjunction with the construction industry, government and academia to provide performance improvement products and services for the construction and related industries. In recent times the organisations' name was shortened to CIRIA. Today, CIRIA is now known solely by its abbreviated name. More information can be found on their website <http://www.ciria.org/index.html>

HSE: Health and Safety Executive

LA: Local Authorities

SEPA: Scottish Environment protection Agency

SfS2: "Sewers for Scotland 2nd edition" the forthcoming revised edition of SW technical manual providing guidance on the design and construction standards applicable to the public drainage system.

SUDS: Sustainable Urban Drainage Systems