Developer's guidance note

Surface water soakaways

Wiltshire Council
Where everybody matters

Contents

Revision number	Revision date	Nature of revision
001	19/11/2018	First issue
002	13/12/2018	Reference to CIRIA C574 added

1. Introduction

This document is issued for guidance to developers who are considering a new development or redevelopment. It sets the standard for the design, construction, operation and maintenance of soakaways that must be met for planning approval and adoption. It **applies to soakaways for surface water management serving new dwellings and major development**[1]. It **does not** apply to minor development[2] and soakaways for road drainage or foul drainage.

2. What is a soakaway?

Soakaways are a form of sustainable drainage (SuDS). The SuDS Manual[3] defines them as follows:

Soakaways are excavations that are filled with a void-forming material that allows the temporary storage of water before it soaks into the ground.

Historically, small soakaways draining runoff from a single property were either filled with rubble or lined with brickwork and were sited below gardens and drives with no formal provision for access and inspection. Many small soakaways are now constructed with geocellular units available from builder's merchants pre-wrapped in geotextile. The geocellular units provide good overall storage capacity compared to rubble fill, and they allow the size of the structure required for any application to be minimised.

Larger soakaways may be constructed with perforated precast concrete manhole rings surrounded with granular backfill or using geocellular structures.

---

1. The Town and Country Planning (Development Management Procedure) (England) Order 2015 defines major development as development involving any one or more of the following—
   a) the winning and working of minerals or the use of land for mineral-working deposits;
   b) waste development;
   c) the provision of dwellinghouses where—
      i) the number of dwellinghouses to be provided is 10 or more; or
      ii) the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the development falls within sub-paragraph (c)(i);
   d) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or
   e) development carried out on a site having an area of 1 hectare or more.
2. The National Planning Policy Framework 2018 defines minor development as:
   a) Minor non-residential extensions: industrial/commercial/leisure etc extensions with a footprint less than 250m^2.
   b) Alterations: development that does not increase the size of buildings eg alterations to external appearance.
   c) Householder development: For example; sheds, garages, games rooms etc within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling eg subdivision of houses into flats.
3. CIRIA C753 *The SuDS Manual*, 2015. ISBN 978 0 86017 760 9

3. How do they work?

Soakaways are used to manage surface water runoff and recharge the groundwater. They store the water temporarily and allow it to soak (infiltrate) into the surrounding ground.

They must discharge the stored water sufficiently quickly to provide the necessary capacity to receive the next storm. The performance of a soakaway is dependent on the shape and size of the soakaway, the surrounding soil's infiltration characteristics and the depth to groundwater.

The geotextile wrapping prevent soil ingress that can reduce the storage capacity and the ability to discharge into the ground.

4. Design, construction, operation & maintenance

For soakaways serving a **single dwelling**, the design and construction should be carried out in accordance with BRE Digest 365[4] and the Building Regulations Part H[5]. The soakaway should discharge from full to half-volume within 24 hours in readiness for subsequent storm inflow. The soakaway should be sized to contain the 1 in 10 year rainfall event. The Building Regulations Part H require small soakaways draining an impermeable area of 25m^2 or less to use a design rainfall of 10mm in 5 minutes as worst case. Soakaways serving an impermeable area of more than 25m^2 should determine the design rainfall in accordance with BRE Digest 365.

For soakaways serving **more than one dwelling**, the design, construction, operation and maintenance should be carried out in accordance with the SuDS Manual. The soakaway/s should discharge from full to half-volume within 24 hours in readiness for subsequent storm inflow, unless there is clear evidence that this would result in very large storage volumes. Under these circumstances longer emptying times may be agreed with us. The soakaway/s should be sized to comply with the Defra Non-statutory technical standards for sustainable drainage systems, which requires the following:

- **S7** The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event.

- **S8** The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.

- **S9** The design of the site must ensure that, so far as is reasonably practicable, flows resulting from rainfall in excess of a 1 in 100 year rainfall event are managed in exceedance routes that minimise the risks to people and property.

---

4. BRE Digest 365 *Soakaway design*, 1991 (minor revisions 2003). ISBN 1 86081 604 5
5. The Building Regulations 2010 *Drainage and waste disposal (Part H)*, 2015. ISBN 1 86081 604 5

Table 1 – Summary of design approach based on size of development

Design criteria	Single dwelling		More than one dwelling
	Impermeable area of 25m^2 or less	Impermeable area of more than 25m^2	
Design event	1 in 10 year Design rainfall in accordance with Building Regulations Part H	1 in 10 year Design rainfall in accordance with BRE Digest 365	1 in 30 and 1 in 100 year Design rainfall in accordance with the SuDS Manual and Defra Non-statutory technical standards for SuDS
Emptying time	From full to half-volume within 24 hours.		From full to half-volume within 24 hours, unless this would result in very large storage volumes, then emptying times may be agreed with us.

Pre-treatment is mandatory to remove sediment and silt that can clog voids and cause the soakaway to fail. Soakaways should not normally be used to drain areas with a high risk of soil erosion, due to the risk of clogging voids and the surrounding soil.

The risk of groundwater pollution must be addressed. Runoff from roofs can be discharged directly to a soakaway, however runoff from paved surfaces should be passed through a suitable form of oil interception prior to discharge to a soakaway.

A minimum of 1m clearance between the base of the soakaway and the maximum groundwater level is required, taking into account seasonal variations. This is to prevent rising groundwater from reducing the available storage capacity within the soakaway, to ensure a sufficient depth of unsaturated material, and to protect the groundwater from contamination.

As the performance of a soakaway is dependent on the soil's infiltration characteristics and the depth to groundwater, site investigations are required to confirm these.

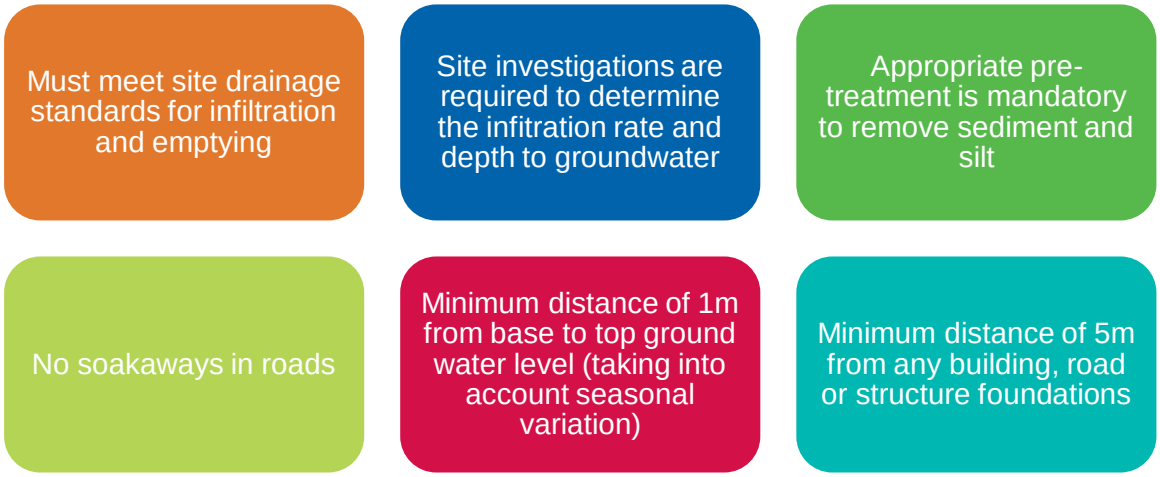
No soakaway should to be installed under the carriageway. This is to ensure access for future maintenance.

Soakaways should not be constructed closer than 5 m to any building, road or structure foundations. In chalk, or any other fill material prone to instability, soakaways should be sited at least 10 m away from any building, road or structure foundations, in line with CIRIA C574[6].

Soakaways should normally not be constructed in areas at risk of any type of flooding – river, surface water, groundwater, sewer, reservoirs or canals. If this is not possible, the storage calculations should account for the additional storage required to contain existing flooding. See section 5 for further discussion on groundwater flooding.

6. CIRIA C574 *Engineering in chalk*, 2002. ISBN 978 0 86017 574 2

Figure 1 – Summary of key design considerations for soakaways



For road drainage soakaway design, refer to the Design Manual for Roads and Bridges.

For the rules that apply to foul drainage soakaways (septic tanks), refer to the EA guidance.

5. Areas at risk of groundwater flooding

The surface water discharge hierarchy (figure 2 below) states that the first option that must be considered for surface water disposal is infiltration to ground. Only after this option has been discounted, can other options be considered.

Figure 2 – Surface water discharge hierarchy

,

However, there are instances where infiltration to ground is inappropriate and soakaways will not work. The groundwater level is a major factor in determining whether a soakaway is viable or not. A high groundwater table is an indication of limited infiltration potential.

Groundwater levels also fluctuate with the seasons, therefore it is imperative to determine the maximum level taking into account seasonal variability. This can be done by monitoring on site or consulting nearby historical borehole records. This will ensure that the soakaway will perform as expected under a range of circumstances and when needed. The worst case scenario is typically heavy rain falling onto saturated soil with the groundwater recharged. The soakaway should be designed to work even under these conditions.

There are various sources of information available to understand the groundwater flood risk for a development. These are discussed in further detail below. Developers should consult these documents, maps, and the relevant authority, and take this information into account when determining the viability of a soakaway for surface water management.

5.1 Information available from Wiltshire Council

We have prepared a Groundwater Management Strategy. This can be downloaded from our drainage page. Section 11.2 deals with soakaways and outlines our planning approach in areas susceptible to groundwater flooding.

5.2 Information available from the Environment Agency

The Environment Agency (EA) have produced maps detailing Areas Susceptible to Groundwater Flooding, but the level of confidence in the accuracy of the information means that maps should only be used to identify broad areas at risk rather than individual properties. The mapping can be obtained from their spatial data catalogue.

5.3 Information available from water and sewerage companies

In areas with a high groundwater table, there is a risk of groundwater infiltration into sewers and drains. This can lead to sewer flooding.

Wessex Water have developed infiltration reduction plans for areas at risk of groundwater infiltration into sewers and drains. They have produced maps which show infiltration consultation areas. Higher risk areas require consultation for all types of development and lower risk areas require consultation for developments of 10 or more properties. The maps can be viewed via their Drainage and Wastewater Management Plans portal (click on Drainage Strategies/Infiltration Reduction Areas).

Thames Water have taken a similar approach and produced drainage strategies for areas at risk of groundwater infiltration into sewers and drains. The drainage strategies can be found on their website here.

6. Drinking water source protection zones

Groundwater provides a source of drinking water. It is therefore important that we look after this source and ensure that our drinking water stays safe to drink.

The EA has defined source protection zones (SPZs) for groundwater sources such as wells, boreholes and springs used for public water drinking supply.
These zones show the risk of contamination from any activities that might cause pollution in the area. There are four zones, with zone 1 being the highest risk and zone 4 being the lowest risk.

The EA's approach to groundwater protection sets out the protection measures that are required for activities in each respective SPZ.

Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, a hydrogeological risk assessment should be undertaken, to ensure that the system does not pose an unacceptable risk to the source of supply.

To check whether your development is located in a SPZ consult the Magic Map/Designations/Land-Based Designations/Non-statutory/Source Protection Zones merged (England).

7. Adoption

It was originally envisaged that under Schedule 3 of the Flood and Water Management Act 2010, Lead Local Flood Authorities (LLFA), such as Wiltshire Council, would be required to establish SuDS Approval Bodies. This would have required us to approve, adopt and maintain SuDS features in new developments. However, in December 2014, the Government issued a ministerial statement on SuDS announcing that Schedule 3 would not be enacted, and instead SuDS would be dealt with by strengthening existing planning policy. Therefore, as LLFA, we have no obligation to adopt SuDS.

Currently, we may adopt SuDS for road drainage as part of road adoptions under Section 38 of the Highways Act 1980. We do this in our capacity as Highway Authority. However at this stage, we do not adopt SuDS for property drainage as an LLFA. To find out more about the processes required to secure road adoption, contact us at HighwaysDevelopment@wiltshire.gov.uk.

Soakaways can also be adopted by water and sewerage companies (WaSCs). Sewers for Adoption 8th Edition introduces SuDS adoption by WaSCs, and section C7.10 set out the standards that soakaways must meet if they are to be adoptable by a WaSC in England. Water UK has published a pre-implementation version of edition 8, which is expected to come into effect by mid-2019. Prior to full implementation, edition 8 will exist alongside editions 6 and 7. In that period, some WaSCs may be in a position to enter into agreements for the adoption of assets under edition 8. Developers are advised to contact the relevant WaSC to discuss the potential adoption of a soakaway.

8. What developers need to do

Developers must submit the information as set out in the checklist below when submitting a planning application.

Checklist – Minimum evidence required when submitting a planning application

Type of evidence		Pre-application	Outline	Full	Reserved matters
Site	Site location plan	✓	✓	✓	
	Site plan showing impermeable area to be drained to soakaway and location of proposed soakaway (including dimensions to nearest structure)	✓	✓	✓	
	Results of flood risk assessment for **all sources** of flooding	✓	✓	✓	
	Evidence of consultation with WaSC if development is located in area at risk of groundwater infiltration into sewers and drains		✓	✓	
	Evidence of consultation with EA if development is located in SPZ1		✓	✓	
Site investigations	Plan showing location of trial pit/s and dimensions	✓	✓	✓	
	Infiltration rate calculations from all trial pit tests	✓	✓	✓	
	Written results of groundwater level assessment (taking into account seasonal variation)	✓	✓	✓	
	Nature of geology	✓	✓	✓	

Type of evidence		Pre-application	Outline	Full	Reserved matters
	If 10m clearance cannot be achieved in chalk, or any other fill material prone to instability, evidence of specialist geotechnologist advice as to the suitability and location of a soakaway.		✓	✓	
	Geotechnical Assessment Report (only for major development)			✓	✓
Design	Drawing showing cross-section of proposed soakaway/s (including maximum recorded groundwater level)			✓	✓
	Storage volume calculations		✓	✓	
	Emptying time calculations		✓	✓	
Operation and maintenance	Details of operation and maintenance arrangements to ensure an acceptable standard of operation for the lifetime of the development eg what will be done, how often and by whom?			✓	✓
	Adoption/ownership details		✓	✓	