The SuDS Manual – Frequently asked questions

1. Is 'source control' still a requirement of the new SuDS Manual?

Yes. 'Source control' components are fundamental elements of a SuDS scheme. The benefits of source control are specifically described in Box 4.3 (Good Practice for SuDS Treatment Design) and the indicative suitability of different SuDS components within the SuDS Management Train are presented in Table 26.7.

'Source control' is not defined as a specific 'requirement' or a 'design criteria' as the term does not describe what the component or system should deliver.

The term 'source control' describes SuDS components that can deliver one or more of the following:

- Capture, store and remove (e.g. rainwater harvesting systems, green roofs)
- Capture, store and treat (e.g. pervious pavements, detention basins, bioretention systems)
- Capture, convey and treat (e.g. swales)
- Capture, store and infiltrate (e.g. soakaways, infiltration trenches)

It is preferable to implement such systems at or very close to the source of the runoff but, if sites are constrained, runoff may have to be conveyed a distance downstream. In both scenarios, however, the components should still be able to meet the same design objectives and will still need to consider the full range of quantity, quality, amenity and biodiversity objectives and criteria for the system.

So – instead of specifying what components or what type of components a system should comprise, or where those components should lie, the Manual specifies requirements in terms of 'performance outcomes' i.e hydraulic, water quality, amenity and biodiversity).

Source control components, as described above, will be key to delivering a number of the design standards in the Manual, in particular, Interception (Water Quantity Standard 1, Water Quality Standard 1).

Interception is the prevention of runoff from the site for the majority of small rainfall events. When rain falls on greenfield sites, it produces no discernible runoff for these events. In contrast, rain falling on impermeable surfaces causes rapid runoff for almost all events – and this can lead to erosion and ecological deterioration of receiving waterbodies. In addition, runoff from developed surfaces tends to be contaminated with urban pollutants which are then discharged into the environment with every runoff event. By designing systems to prevent runoff from small rainfall events, receiving waterbodies are protected and pollutants are trapped in components potentially allowing time for them to degrade and/or storing them for future removal.

By capturing and storing or conveying runoff in soil or aggregate systems – source control components are allowing runoff from small events to be harvested, infiltrated and/or

evapotranspired – thus minimising runoff for most small events (unless they occur during long periods of exceptionally wet weather) and delivering on the Interception criteria.

Source control components can also deliver on a range of other criteria/standards – reducing peak flows and volumes, treating runoff, and providing wide-ranging amenity and biodiversity value to sites. The extent to which they do this will depend on the design.

2. Are there maximum areas that should discharge to individual SuDS components?

No. Maximum areas are not specified as the Manual defines requirements as 'performance outcomes'. The maximum area that can be discharged to any individual component will be dependent on:

- The size and design characteristics of the component (including any sediment pretreatment systems); and
- The characteristics of the drained area (e.g. % impermeability, slope and land use).

Both of these issues will influence the rate and volume of runoff entering the component, and the likely pollutant load – in particular sediment load as this can causing components to clog or suffer from reduced hydraulic capacity.

Maximum areas are normally specified to ensure the velocities of runoff entering components are non-erosive, sediment accumulation rates are suitably low, treatment performance is effective, and health and safety risks are low. All these aspects are specified within design criteria or component design methods (as set out in individual component chapters).

Chapter 7 (Section 7.5.4) describes how best to split the site into surface water subcatchments, and this process will be very important in terms of determining the suitability of sizes of different contributing areas.

3. My site is a residential site, with low pollution risk – can I just discharge the runoff, via pipes, to a pond as this SuDS component mitigates the pollution hazard level?

No. Table 26.3 in the SuDS Manual specifically highlights the risks associated with using ponds to remove sediments. Sediment build up in ponds will have significant negative consequences for its amenity and biodiversity value, and will in time require costly maintenance intervention for its removal. Sediment should normally be removed in upstream components and ponds used for 'polishing' the runoff as a secondary component. In Table 26.7, ponds are not recommended for use 'at source' or as primary treatment components unless they are only receiving roof runoff.

In addition, ponds do not deliver the Interception requirements (Water Quantity Standard 1 and Water Quality Standard 1) as they do not promote any reduction in runoff volume. This should be delivered in components upstream of any pond.

When designing for treatment, reference should be made to Box 4.3 (Good Practice for SuDS Treatment Design).

4. What are the drivers for splitting the site into drainage sub catchments?

There are a number of drivers for splitting sites into drainage subcatchments, although the size and layout of the site will dictate the value and feasibility of this approach:

- Managing runoff from smaller areas helps keep flow rates and water depths low – normally more appropriate when managing flows in surface systems
- It is easier to design effective treatment systems when the flow rates and pollutant loadings are relatively low
- The treatment provided can be proportionate to the pollutant loadings ie. parts of the site with low pollutant loads do not need to have as much treatment as more polluting parts of the site.
- Accidental spills or other pollution events can be isolated more easily and dealt with effectively without affecting the downstream drainage system.
- It encourages pollution 'ownership' e.g. responsibility for performance and maintenance can lie with the property owner
- Poor component performance or component damage/failure can be isolated more easily and dealt with effectively without impacting on the whole site.
- Chapter 7 (Section 7.5.4) describes how best to split the site into surface water subcatchments.

5. What is the logic behind requiring a 1m separation depth between the base of an infiltration component and the groundwater table ?

The 1m separation distance is considered a pragmatic design approach for infiltration systems:

- It helps ensure that there is an adequate distance between the maximum likely groundwater level and the base of the infiltration device. Groundwater observations are often limited and predicting extreme levels can be uncertain. If groundwater rises above the base, the storage capacity of the infiltration component will be reduced and the performance of the system will change from that for which it was designed.
- 1m of underlying soils provides protection of the groundwater from contaminants which may find their way into runoff entering the component. Groundwater protection is extremely important as it is a very valuable resource and, once it becomes polluted, is extremely difficult if not impossible, to clean. Urban runoff is usually contaminated to some extent and even roof runoff can be polluted. Contaminants may be relatively predictable, or may be very unpredictable – resulting from an accidental spill or from someone using the surface water system as a means of illegally disposing of chemical waste. It should be noted that the requirements for groundwater protection set out in Chapters 4 and 26 have been agreed with the respective environmental regulators.

6. Why does the SuDS Manual not reference borehole soakaways?

Borehole soakaways may be appropriate for the discharge of surface water runoff in certain scenarios. However they are considered to be a highly site specific design solution that will require site specific risk assessment and design to ensure that risks to groundwater are minimised to appropriate levels. The level of guidance required for the design of borehole soakaways was considered too extensive for this manual, and they were not considered to represent a 'standard' generic design solution for surface water management for development sites.

7. Why is the 'source – site – regional' control concept no longer in the Manual ?

The focus of the Manual is on surface water management for development sites. Regional control systems would be designed as part of regional strategies for flood risk and/or surface water management and are likely to have different design objectives from development site systems. The existence of regional systems may well influence the design criteria of site systems in the area.

Instead of specifying what components or what type of components a system should comprise, or where those components should lie, the Manual specifies requirements in terms of 'performance outcomes' i.e hydraulic, water quality, amenity and biodiversity).

Link to items (1) and (4) above.

8. Why are there so many equations in the rainwater harvesting systems chapter, when the design of rainwater harvesting systems should be so easy ?

Designing rainwater harvesting systems to ensure there is a suitable volume of water available to meet demand in a property – is relatively straight forward and thus the design equations are fairly simple. However, designing rainwater harvesting supply systems to manage surface water runoff in order to meet specified performance outcomes is not so straightforward. A rainwater harvesting storage tank designed for supply purposes only may well be full when a large storm event arrives, and would overflow immediately; the system would therefore offer no runoff storage and would not reduce runoff rates or volumes. The more complex equations set out in the SuDS Manual describe the outcomes of a research project which allows rainwater harvesting storage tanks to be designed with 'extra' capacity that will guarantee a level of performance during a storm event. This research work (and the same equations) are also presented in BS8515 (REF), Appendix A: 2013.

The Manual accepts that rainwater harvesting systems designed for supply only will contribute to Interception (water quantity standard 1, water quality standard 1), as stated in Table 24.6 but will only deliver volume control for larger events if they are specifically designed to do so.

9. When using the Simple Index Approach for treatment design (Section 26.7.1), should I reduce the performance efficiency of secondary components (by a factor of 0.5 as recommended) if it is

known that the upstream component has no impact on the concentrations of a particular pollutant type?

This should be agreed with the environmental regulator – but it would probably be appropriate not to use the 0.5 factor in this scenario (for the relevant pollutant only).

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