

Permavoid: A System for All Applications

In the final Technical Bulletin of the series, we summarise the topics we have covered in the series so far, as well as detailing the key benefits of the Permavoid sub-base replacement system.

Our Technical Bulletins have illustrated the Permavoid system's capabilities in detail, providing thorough explanations of how the system works to provide you with the optimum solution for your project, as well as including detailed cross-sections of typical system configurations.

By providing shallow stormwater retention, attenuation, infiltration and treatment at source, the Permavoid system offers a versatile solution for a wide variety of applications, and can be used as part of an engineered or soft SuDS solution in greenfield and urban areas. It also enables designers to offer a system that incorporates water treatment and passive irrigation, to manage and re-use water at source.



Issue 1:
A Shallower System

Issue 2:
Sub-Base Replacement

Issue 3:
Source Control

Issue 4:
Surface Water Treatment

Issue 5:
Passive Irrigation

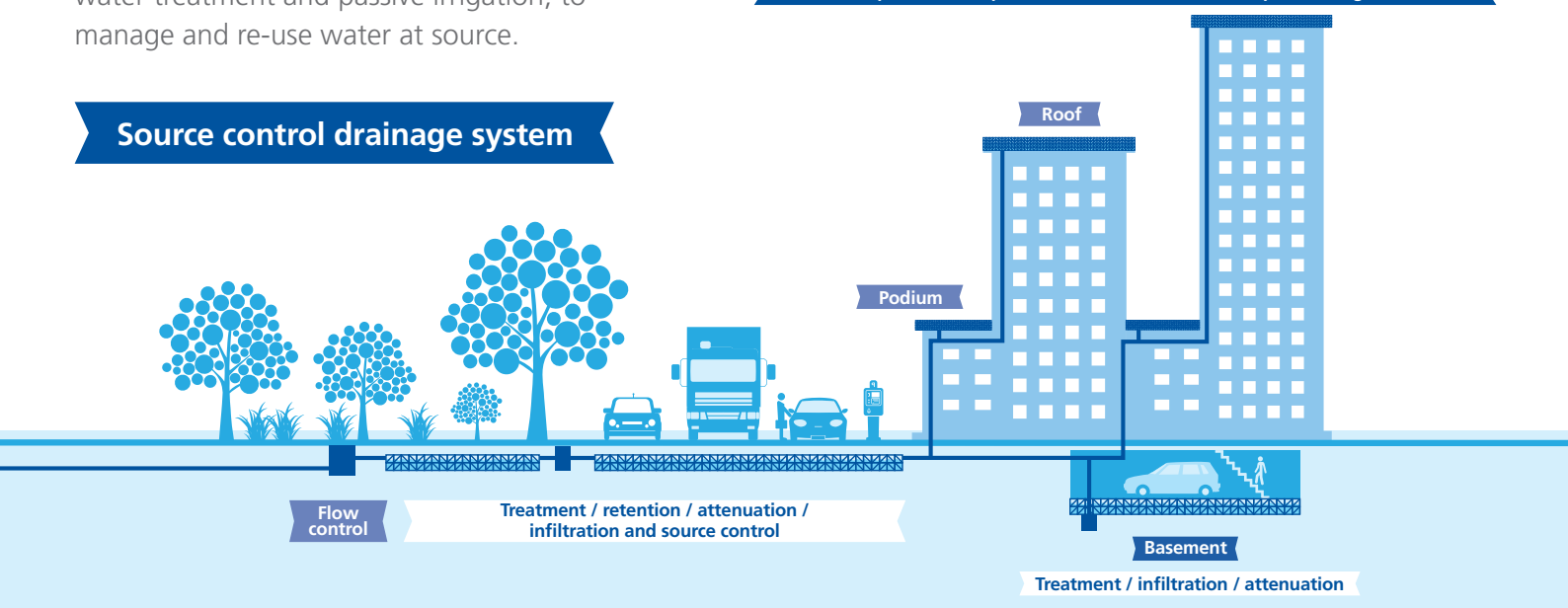
Issue 6:
Urban Streetscapes

Issue 7:
Roads and Highways

Issue 8:
Residential Developments

Roof interception to incorporate attenuation / retention / passive irrigation / re-use

Source control drainage system



Strong Interlocking Raft



Beneath porous & non-porous surfaces



Source Control



Treatment



Retention



Attenuation



Infiltration

1 Shallower Systems

This bulletin introduced some of the benefits of shallow installations over deep excavations on projects where problematic ground conditions, such as high water tables and contaminated land, are a prevalent issue. The Permavoid system can be installed beneath impermeable and permeable, trafficked and non-trafficked areas, and incorporates a range of components that can separate silt and hydrocarbons at source.

2 Sub-Base Replacement System

The Permavoid system is designed to be used in place of, or in conjunction with, a traditional aggregate sub-base, providing a unique high strength, consistent structural raft with all the benefits of a high voided modular geocellular structure. The system can be incorporated into the full range of traffic conditions, from domestic driveways to HGV applications.

3 Source Control

This bulletin highlighted how the capture of rainwater at source, and the subsequent control of surface water run-off, is integral to the SuDS philosophy. The capture and retention of surface water minimises changes in the volume and rate of run-off from pre-development (greenfield/brownfield sites) to post-development.

4 Surface Water Treatment

Pollution is collected from many sources and hardstanding areas and is known as 'diffuse' pollution. The overall environmental impact can be very serious to the quality of the receiving water bodies. The Permavoid system incorporates a number of effective passive treatment components to provide water treatment at source, ensuring compliance with British Standards.

5 Passive Capillary Irrigation

Passive irrigation is a method of growing plants and grasses using an inert porous medium to transport water and oxygen to the root zone by capillary action. Water can be supplied on demand across the Permavoid structural raft, while regulating the water needed to provide optimum irrigation of the root zone.

6 Urban Streetscapes

The Permavoid system can help to enhance natural features in built-up areas by creating a structural platform on which green areas can be cultivated, irrigated and oxygenated. This bulletin tells of how the Permavoid system can help to 'make space for water' in areas where such projects are challenging, thus providing an excellent opportunity to collect, retain and re-use rainwater as a resource.

7 Roads and Highways

The management of surface water run-off from roads and highways can provide substantial benefits to the built environment, facilitating the use of water as a valuable resource. Permavoid can enhance the natural environment by providing improved attenuation and treatment at source, using water management features as prime design elements in road and highway drainage.

8 Residential Developments

The need to balance the provision of land for housing and public amenities, whilst protecting biodiversity, provides a major challenge for developers. In conjunction with soft SuDS techniques, the Permavoid system can 'make space for water', by providing retention, attenuation, infiltration and treatment at source, resulting in developments that enhance the ecological needs of the site and its residents.



Strong Interlocking Raft



Beneath porous & non-porous surfaces



Source Control



Treatment



Retention

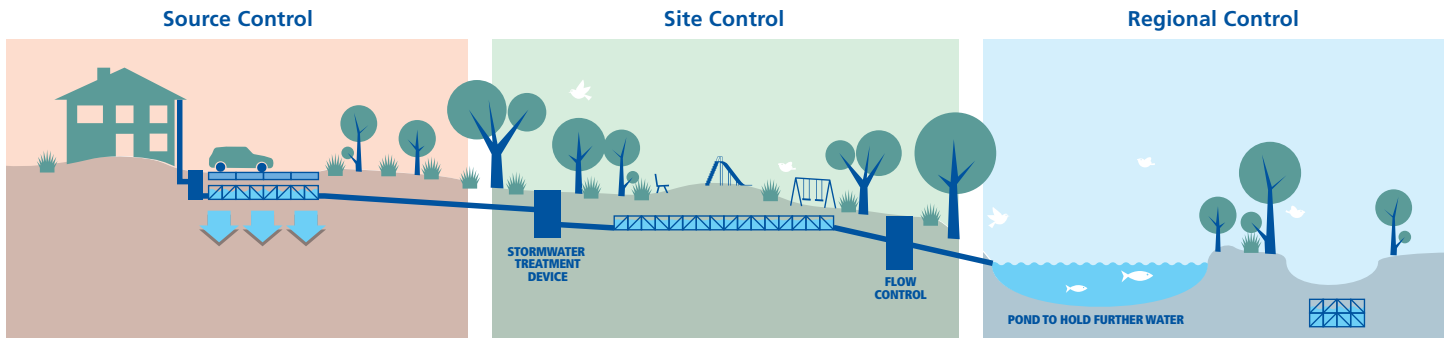


Attenuation



Infiltration

Key Benefits of the Permavoid system: **A Summary**



Application

- Control and manage surface water run-off at source
- Can be installed above a high water table
- Ideal for brownfield or contaminated sites
- Allows water to be spread across a site
- Provides treatment to remove silt and hydrocarbon deposits
- Re-uses water as a resource
- Provides an under-soil drainage system and can be incorporated into a sustainable stormwater management system
- Helps establish calming, tranquil spaces to promote health and well-being
- Supports the creation of landscapes in urban settings that mimic nature
- Can be used in conjunction with the full range of Polystorm geocellular solutions for deeper excavations

Design

- Designed and tested for retention, attenuation and infiltration at shallower depths
- Removes the requirement for pumping stations
- Individual modular units tie together using Permatie interlocking connectors
- Permaties have integral creep resistance, provide rigidity and minimise deflections

Installation

- Interlocking raft for rigidity and a high compressive and tensile strength under load
- Suitable for use beneath porous and non-porous surfaces
- Reduction in excavation depth and cost
- No need for trench supports or plant to deliver and remove trench support panels
- Oil interception at source - no need for petrol interceptors

For more information about the Permavoid system, our Permavoid Technical Manual provides an indispensable guide to help you develop your next shallow SuDS solution. It includes details on topics such as hydraulic and structural design, SuDS legislation and pollution control, helping you to make an informed decision.



Contact Us

to find out about our Technical Workshop

Look out for our Permavoid Technical Manual, available to download from our website