Paving the way to flood prevention

Installing of Sustainable Drainage Systems (SUDS) could do much to alleviate the down stream flooding and poor water quality that can be attributed to conventional gully and pip drainage systems, reports John Howe, General Manager of Interpave – the Precast Concrete Paving and Kerb Association

SUDS is a design philosophy which uses a range of techniques to manage surface water by attenuation and filtration with the aim of replicating, as closely as possible, the natural drainage prior to a site being developed.

Governmental planning policy guidance, such as Planning Policy Statements 23 and 25 in England, require the use of SUDS wherever possible in order to reduce, attenuate and clean-up runoff to help prevent flooding. The Statements apply to all types of developments covered by planning law, whether new-build or work to existing developments.

The Planning Policy Statements are supported by the Building Regulations and other government guidance including the *Manual for Streets* and the *Code for Sustainable Homes*. However, their application through the planning system locally has been sporadic and hindered by confusion over responsibilities, ownership and adoption of the SUDS.

This is now being addressed by the Government which wishes the use of SUDS become mainstream. The Department for Environment, Food & Rural Affairs (Defra) published *Future Water* earlier this year, its water strategy for England. This, together with similar initiatives anticipated for Wales and Scotland, considers water supply, flood plain development and other aspects of water needs.

Future Water highlighted that the major obstacles to the wide uptake of SUDS included ownership, maintenance and funding arrangements. These need to be addressed in order to facilitate the ownership and adoption of SUDS across the main agencies involved in urban and land drainage.

A useful and versatile SUDS technique is Concrete Block Permeable Paving (CBPP). This provides important attenuation and pollution source control and in addition CBPP does not need additional land take unlike 'soft' SUDS landscaping techniques such as wetlands and ponds.

CBPP works by allowing water to pass through the surface between each block and into the underlying permeable sub-base. Here, it is stored and released slowly either into the ground, to the next SUDS management stage or to a drainage system. CBPP has lower initial cost and whole life costs than the equivalent impermeable pavements. Furthermore, there is no need for additional maintenance as research has found that even after the joints have silted up, water infiltration stabilises above design rates.

Used for projects ranging from footpaths and communal street areas to container terminals, permeable paving can play an important role in providing attractive urban landscapes that meet the 'liveability' requirements of the *Manual for Street* and other urban design guides.

CBPP can be used for either new projects or retrofitted to existing developments. For example, it plays a significant role as part of the holistic sustainability strategy of the new Hazeley School in Milton Keynes. Firstly, foot paths, car parking, cycle racks and other paved areas are terraced to slope away from the school building. Interconnecting compartments beneath the terraces provided a controlled water flow into two separate ponds. In the case of heavy rainfall, the water can overflow into a storm sewer. Secondly, water run-off from the roof, playground and paving is harvested and cleaned for grey water use to flush toilets.

"INTERCONNECTING COMPARTMENTS BENEATH THE TERRACES PROVIDED A CONTROLLED WATER FLOW INTO TWO SEPARATE PONDS"

The ease of retrofitting CBPP is demonstrated by the Dings Home Zone developed by Bristol City Council in partnership with the charity Sustrans. The installation of CBPP attenuates and treats the water before it is discharged to a nearby watercourse, and so relieves the existing combined sewer system which was working at full capacity. The project is one of the first retrofitted permeable paving schemes in the UK. It has been adopted as a 'highway' by the local authority.

Used in either isolation or as part of a total SUDS sustainable water management strategy, CBPP offers a viable solution to the problem of excessive surface water run-off, a problem that if the predictions of climate change are correct could become more frequent and more widespread in the future.

For further information on SUDS, visit: www.paving.org.uk