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Richard Wigzell, Director of Ingent Consulting Engineers considers the progress of sustainable drainage systems and assesses their impact on the market.

A decade ago, 2007 saw Britain battered by a series of high intensity storms creating major damage and triggering the commissioning of the Pitt Review of the country's ability to plan and respond to such events.

Traditionally the accepted form of surface water management had been to convey rainwater from storm events away from urban areas as swiftly and effectively as possible. Whilst protecting the immediate areas from storm water effect, this approach did inevitably create impact elsewhere when storm water would appear downstream far quicker and in greater volume than previously experienced.

With firm projections of climate change effect on rainfall and increasing urbanisation a fact, it was recognised that unsustainable drainage practices in development drainage were contributing significantly to the flood events causing such damage.

The fundamental concept of sustainable drainage systems (SuDS) is a simple one. Most undeveloped sites will have evolved a means of surface water drainage over time that will be satisfactory for its current use. If drainage for the developed site can be designed in such a way as to mimic the existing as closely as possible in all ways, then there will be minimal drainage impact from the development.

Minimising impact

Whilst this approach deals with the downstream mitigation of development storm water, the principles of sustainable drainage go further and also seek to minimise the impact of urbanisation within development. Issues of water quality, amenity and bio-diversity are considered alongside quantity.

SuDS sets out that effective management of surface water can not only preserve or improve the quality of water entering the drainage catchment, but



through considered design can also provide environmental and ecological benefits to enhance the experience of the community within the development.

SuDS techniques

Whilst SuDS can take many forms, the techniques will generally involve discharging surface water in one of two ways. Where based over granular soils, developments can benefit from infiltration features which offer the purest method of surface water drainage, and is preferred by planning policy. With infiltration, rainfall is dealt with at or very close to source and returned to the underlying water table in a filtered and clean state thanks to the action of the soils through which it percolates.

Over more common impermeable ground, surface water will naturally tend to discharge in storm conditions to receiving ditches, dykes and watercourses, capable of draining water from sites at a relatively low greenfield rate. The challenge to developments is therefore to mimic the greenfield characteristics through attenuation across storms predicted for the development's lifespan.

Permeable solutions

Infiltrating SuDS can take many forms and as well as the humble soakaway, features such as permeable pavements, drainage blankets, dry and wet swales and infiltrating basins and trenches regularly feature in designs. Other than conventional

soakaways, the feature widely considered to have gained most traction has been permeable pavement.

Attractive in appearance, an ever-growing history of problem-free installation and underwritten manufacturer designs have made permeable pavements increasingly commonplace. However, despite overcoming the reservations of many developers and ticking all the boxes of sustainability, many Highway Authorities maintain a fundamental and steadfast refusal to adopt permeable pavements. Concerns over the longer term maintenance of such pavements, unknown maintenance regimes and the difficulties presented by service intrusions, all contribute to the current stand-off.

Similar problems have haunted other SuDS features such as basins, swales and even longitudinal bio-retention features. Although actively promoted by the Planning Authorities and policies of sustainability, very few SuDS features are being successfully adopted.

Recent times have seen the emergence of newly-formed independent water companies applying to be appointed as Sewerage Undertakers and prepared to adopt SuDS, and also longstanding bodies such as Internal Drainage Boards, ideally suited in many ways to SuDS adoption taking commercial interest in the maintenance of SuDS within developments. Through innovation and determination, SuDS continues to come of age.



A newly formed retention basin

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