

Realising the wider benefits of managing surface water



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The UK is seeing a shift in its approach to managing surface water. Water and its management is now beginning to be seen as an opportunity. We are starting to look at 'drainage problems' and consider: 'what benefits can we get from our surface water runoff'?

Using sustainable drainage (SuDS) instead of separate surface water piped drainage is increasingly providing the environmental and social benefits of water pollution control as well as addressing flood risk. This is just the tip of the iceberg; there are many more benefits from using SuDS especially where these include green infrastructure. These benefits include: amenity and biodiversity; additional water resources; community, recreation and education; climate change mitigation, adaptation and greater resilience.

Vegetated SuDS, those that contribute to green infrastructure, provide a wide range of opportunities and benefits. Professionals beyond the drainage community recognise that the benefits contribute significantly to economic development and the delivery of natural capital (Eftec et al, 2013; Natural Capital Committee, 2013). Water is an opportunity. This is increasingly recognised around the world. For example the Rotterdam Water Plan will turn around in concept the 'problem' of the water surrounding and falling on the City to an 'opportunity' by taking a positive and opportunistic-led approach to how water and flood risk is managed. In Philadelphia, the added-value benefits of using green infrastructure instead of pipes to deal with combined sewer overflow (CSO) problems is estimated as some \$3bn (USEPA, 2013) and in New York, the green infrastructure plan is estimated to bring some \$1.5bn in annual benefits to the city (Everard, 2013).



Concrete grid pavers can be fitted with soil for grass growth or aggregate for drainage applications

Many organisations realise this, such as CIRIA (Construction and Industry Research Information Association) and others like the Landscape Institute; seizing the initiative within the umbrella of 'Water Sensitive Urban Design' (WSUD). This incorporates SuDS and goes further, encompassing the entire water cycle with urban design and planning (CIRIA, 2013; Ashley et al, 2013).

With growing evidence from around the world (e.g. USEPA, 2013), there should be an expectation that SuDS and potentially WSUD would be rapidly taken up across the UK. The Flood & Water Management Act 2010 supports this by putting into law the Pitt review (2008) recommendations that more SuDS were needed to respond to and manage local flood risk.

Nevertheless change to increase the use of SuDS is at a slow pace within the UK and we are missing the opportunity to create greater value for society. The long wait for the National SuDS standards and for the SuDS Approval Bodies (SABs) demonstrates this. Assuming the parliamentary process can be navigated, SABs will formally operate from April 2014 but Lead Local Flood Authorities are still unsure where their funding will come from and if they have the right level of expertise.

However, change is happening. SuDS are now frequently seen in new development in the UK. Disappointingly, some SuDS schemes are tokenistic such as 'end of pipe' ponds on their own which tend to be ugly and less effective at managing pollution and erosion downstream from runoff. SuDS need to manage both the larger storms and the smaller ones; these causing the bigger impact on receiving waters due to their higher frequency.

This shift began first in Scotland (Duffy et al, 2013) although there's still much to do. In Glasgow the formation of the



Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) is now making great strides to manage surface water with a clear vision. MGSDP are achieving local improvements and providing guidance on using SuDS and designing for exceedance for all new developments. They have also looked strategically across the city, such as the recently completed surface water management study by MWH that looked at flood risk across Glasgow and surface water management interventions culminating in guidance (Digman et al 2013). Such catchment wide approaches are also being seen in the UK where Northumbrian Water working with their drainage partners developed an integrated drainage plan for Tyneside (Kennedy et al, 2012). New initiatives in Wales see the Welsh Government, Welsh Water and the regulators working closely with local authorities to bring about a 'water sensitive Wales' (The Drainage Hub UK, 2012).

Supporting the shift in philosophy and practices, CIRIA is coordinating a number of research and development projects. These are collaboratively funded by organisations, including *inter alia*, government, regulators, consultants, manufacturers and many of the water and sewerage companies. In 2012 CIRIA published guidance led by MWH on retrofitting surface water management focussing on SuDS and their benefits (Digman et al, 2012). The 2007 SuDS manual is under revision, led by HR Wallingford and is expected to be published in 2015. A current project to encourage the careful design of exceedance flow pathways and management measures is intended to inspire professionals and planners in particular in ensuring exceedance is integrated in urban areas, building on the CIRIA 2006 guidance (Balmforth et al, 2006). Exceedance considerations are included in the National Planning Policy Framework in England, but from research carried out for the project, is rarely considered in new development.

Ultimately the uptake of WSUD will bring water to a position where delivery of services is co-managed by communities and key providers. Environmental stress is minimised and benefits maximised by creating and using natural capital. This way will achieve the best value for society as a whole. Pathfinding projects, such as managing flood risk at Mayes Brook Park in north east London are already showing the way (Natural England, 2013). Here the ratio of benefits to costs was 7:1, with 93% of benefits accruing mainly from ecosystem services (cultural services). When we start to maximise the benefits, perhaps then we can start to honestly speak about our water systems, interconnected with our other systems and services as being 'sustainable' (Howe & Mitchell, 2012).

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