



Designing for water

*Water Sensitive Urban Design is a philosophy that puts water at the start — and heart — of our communities. But it can only be achieved collaboratively, writes sustainability development expert **Michael Henderson** and associate water specialist **Sarah Kelly**.*



We often think of water as costly to manage, dirty or not really 'a part' of our lives. But by thinking about water as a vital resource and better managing it through planning and design, we can start to relieve pressure on natural water sources and sewer systems to reduce flood risk, improve water quality and enhance the built environment.

Joining the dots

Increasing intensity of rainfall from climate change, effluent from population growth, ageing infrastructure and flooding are driving us to adopt new ways of managing water.

For these reasons, Water Sensitive Urban Design (WSUD) makes a lot of sense. It considers water at the start and every stage of the design process to source, use and reuse it in a more sustainable way, and it isn't just for new developments: enhancing water management in our towns and cities will only work by adapting what we've already got.



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Through high quality design, WSUD joins the dots between the natural water cycle, built environment and conventional underground water systems to create a more efficient water cycle that also harnesses the potential of green infrastructure to clean and store water, naturally.

SuDS — just the start

The current legislative approach to the UK's urban water challenges is the Flood and Water Management Act 2010, which gives Lead Local Flood Authorities duties and powers to manage flooding from surface water, groundwater and ordinary watercourses within their administrative areas. The National Planning Policy Framework requires developers to demonstrate they have investigated using sustainable drainage systems, or SuDS, such as swales, permeable paving and 'green' roofs in new urban developments.



To help England's South East achieve the Policy's requirements, we developed detailed SuDS guidance, *Water. People. Places*, with the South East Seven partnership of local authorities, to help them and developers implement SuDS tailored to the region's local conditions. This has been an important first step for the region towards becoming more water sensitive.

Working with local environments

With a large proportion of the UK's water systems overloaded or ageing, SuDS can also be retrofitted to existing properties or urban areas, decreasing the risk of surface water flooding and improving water quality by allowing water to filter through 'natural' drains, such as grass and ponds.

Working within the constraints of the existing built environment, we've helped Lambeth Council make small changes to enhance water management, such as reinstalling grass verges along paths and building a series of rain gardens to capture and store runoff from roads, helping to reduce flood risk across much larger areas of the borough. Our study with the council shows that up to 16 per cent less surface water is transferred to the sewer system in a 1 in 100 year event when using SuDS, such as rain gardens.



Reinstalling grass verges along paths capture and store runoff from roads helping to reduce flood risk.



Our scoping study, *Developing Urban Blue Corridors*, with Defra, identifies how a community can create areas to store floodwater within a town to make them more resilient to flooding.



What could a water sensitive block of flats look like?

Economies of scale

Scale is important. The WSUD approach can be applied to a single home, block of flats or offices, a street, or a whole suburb. But there can be economies of scale by applying WSUD over a larger area. For example, by applying WSUD principles to an entire site, such as the North West Cambridge Development where we are creating the UK's first stormwater recycling scheme, the cost is around 40 per cent cheaper than doing it plot by plot.

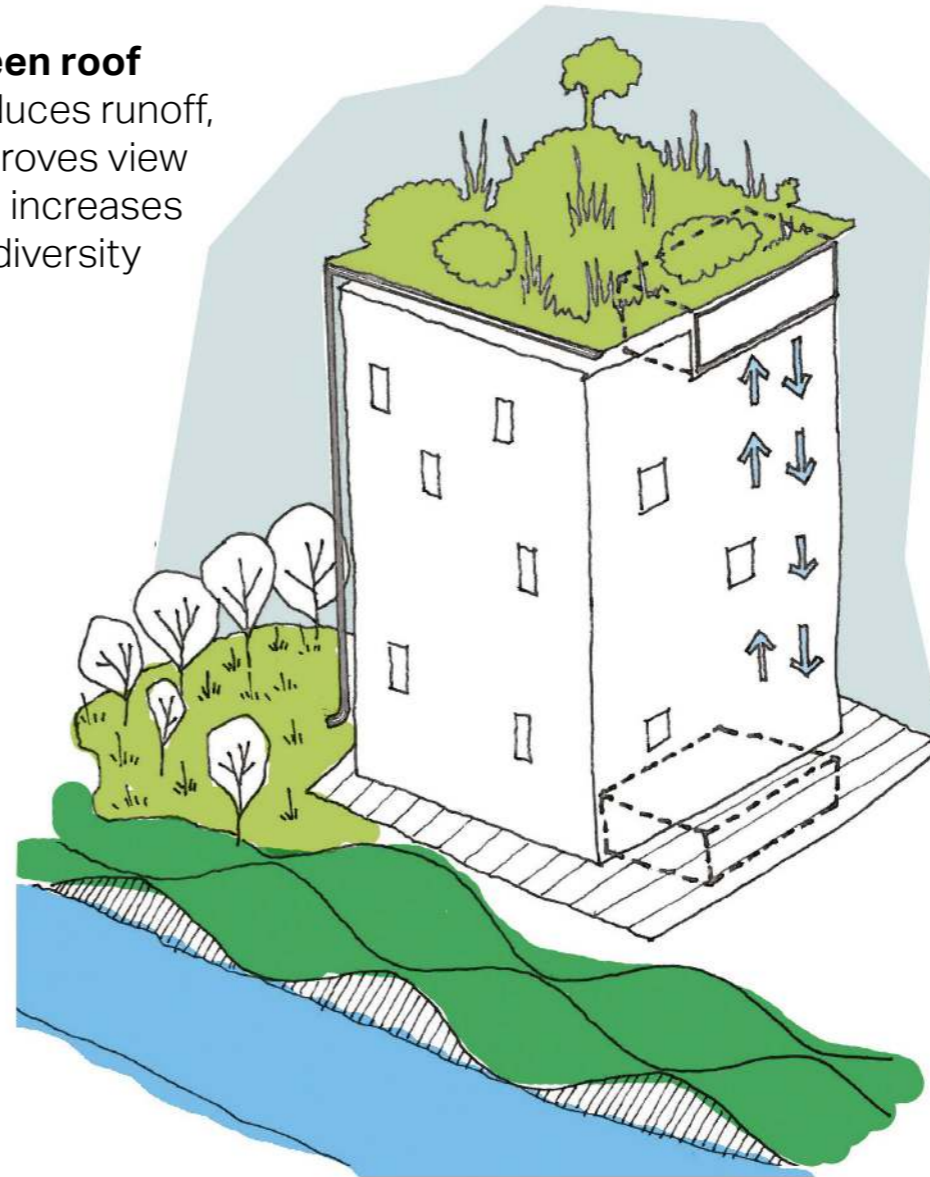
Working together

The reality is that the challenges we face in managing water are likely to get so big that individual organisations cannot solve them on their own. A more water sensitive future can only be achieved through collaboration of developers, water companies, local authorities, individuals and communities.

It's about working out how to work together and helping the community understand the importance of WSUD initiatives by engaging them and stakeholders at the start of, and throughout, the planning process.

Green roof

Reduces runoff, improves view and increases biodiversity



Greywater recycling from flats

Reduces water bills and the amount of water sent to sewers to be treated

Ground floor resilience

Designed and retrofitted to be flood resilient

Quiet, green space

Provides a pleasant, recreational area for residents, reduces runoff and urban heat island effect





If we can get everyone in the same direction, the benefits can be great. To help England's South West deal with the pressures of climate change and population growth, we brought together the University of Exeter, the Environment Agency and local flood authorities to discuss and develop a water sensitive vision for the region. Through facilitating conversations and workshops with stakeholders, we've helped them develop ways to educate and collaborate with the community to understand WSUD and how it can be used.

A self-sufficient future

There's a lot to learn about sustainable flood and water management, but we're learning fast. Large urban regeneration schemes, such as we're seeing in Old Oak and Park Royal in north-west London, are providing great opportunities to make WSUD a standard approach in managing water. The project, which will see tens of thousands of houses, commercial and community spaces built over the next 30 years, will put a lot of stress on the existing infrastructure.



A water sensitive future
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