

The SuDS solution



Suzanne Simmons, CIRIA, discusses the role of sustainable drainage systems (SuDS) in surface water management and the built environment ahead of the issue of the SuDS manual (C753) and Benefits of SuDS Tool (BeST).

CIRIA's early and intuitive belief that sustainable drainage systems (SuDS) make a positive contribution to surface water management (SWM) and the built environment has been demonstrated repeatedly through their successful delivery. This has been supported by publication of the first SuDS manual (C697) in 2007 and more recently the susdrain initiative www.susdrain.org. Access to CIRIA outputs on SuDS-related guidance has seen the delivery of increased numbers of high-quality SuDS, improved methodologies, planning, design and other approaches as well as increased knowledge and research in the area over the ensuing eight years.

"The launch of the CIRIA SuDS manual in 2007 meant that for the first time drainage designers could go to one place to find the technical support they needed to get SuDS in the ground. And the result was that many new developments became the home to SuDS for the first time, to the benefit of their owners and occupiers, and society in general".

David Balmforth, ICE President

This briefing celebrates the 2015 launch of the updated SuDS manual (C753), and the release of the Benefits of SuDS Tool (BeST), designed to evaluate and quantify the multiple benefits of SuDS.

Suzanne Simmons, CIRIA Project Manager spoke to the chair of the SuDS manual update project steering group, Professor David Balmforth (DB), ICE President, its lead author Bridget Woods-Ballard (BWB), HR Wallingford, Dr Christopher Digman (CD), MWH Global, and lead author for BeST, Brian Smith (BS) of Yorkshire Water and Brian Morrow (BM) of United Utilities provided a wider water company perspective.

as thought leadership within this area. In recognition of the interdisciplinary nature of SuDS as well as increased knowledge and research, the SuDS manual has been updated to incorporate the latest technical advice and adaptable processes to assist in the planning, design, construction, management and maintenance of good SuDS. The need to support partnership funding and retrofitting by quantifying the benefits of SuDS has formed the basis for the production of BeST which will be used to compare and assess different SWM approaches for a diverse range of impacts. Importantly, both the SuDS manual and BeST are independent of legislation. The SuDS manual will have a wide audience and has been aimed at several levels of user knowledge, whilst BeST specifically focuses on the designer, planner and developer as the end user.

Our discussions were framed around five key questions below:

Question 1: What significance and positive changes do you think have occurred since publication of the first edition of the SuDS manual in 2007?

The interviewees concurred that it was the 2007 floods, subsequent Pitt Review and the Flood and Water Management Act (FWMA) 2010, which formed the basis of raising awareness of SuDS over the past 10 years. DB talks about the progressive nature of SuDS gradually becoming acceptable, reiterating how implementation of SuDS was a "key recommendation of the Pitt review after the 2007 floods". CD notes, how momentum was lost through the delay in implementation of Schedule 3 of the Act. While BM acknowledges that all the technical skills were available in 2007, which is demonstrated in the content of the original SuDS manual. According to BS the biggest change has been the handover of responsibility for SWM from

the Environment Agency to lead local flood authorities (LLFAs).

"We have eight years more experience of designing and constructing SuDS, which is a good thing. The legacies are mixed – we have a number of inspiring schemes championed by visionaries and great teams of designers and we have some less satisfactory outcomes...where the benefits and opportunities associated with surface water management are not considered early enough or where construction practices have been poor".

Bridget Woods-Ballard, HR Wallingford

While there has not been a huge and rapid uptake of SuDS since 2007, BWB can see steady improvement with the implementation of some excellent schemes demonstrating collaborative efforts and providing emerging SuDS champions with material.

However industry can do better, as CD notes *"we haven't necessarily seen the likes of Upton or Lamb Drove repeated across a whole host of areas"*. SuDS are still being poorly implemented, and BWB believes that this is often due to a lack of professional collaboration and where SWM has not been considered early enough in project design and planning. BWB believes that better monitoring over the past 10 years, could have informed a more confident approach to the implementation and acceptance of SuDS.

CD recognises that there is still a long way to go to prevent *"so-called SuDS schemes being represented as end of pipe projects and bomb craters, rather than distributed measures"*. CIRIA's Paul Shaffer suggests that end of pipe schemes *"are indicative of surface water being viewed as a problem rather than an opportunity or resource that can be creatively and cost effectively exploited"*.

Question 2: How accepted and mainstream has SuDS become as an alternative to traditional below ground drainage systems, and what part has CIRIA played in that time frame?

The experts acknowledge that many more people are engaged and SuDS are increasingly being incorporated into new developments. However they were still not viewed as 'mainstream'. DB considers that some stakeholders do not fully

understand the benefit of SuDS. He talks about *"scepticism around costs and benefits, a sluggishness to enable legislation, and uncertainty over their adoption"*. Long-term maintenance over the life span of a project is seen as an area of critical concern. BS sees uptake as being disappointingly *"slow and fragmented"*. However he believes that *"an increasing number of stakeholders recognise the potential value in SuDS, with SuDS forming an integral component of future policies"*.



Figure 1 Before SuDS implemented, Derbyshire Street pocket park, Bethnal Green, London (courtesy of London Borough of Tower Hamlets)



Figure 2 Re-levelling road bed, Derbyshire Street pocket park, Bethnal Green, London (courtesy of London Borough of Tower Hamlets)



Figure 3 Swale formed, Derbyshire Street pocket park, Bethnal Green, London (courtesy of London Borough of Tower Hamlets)

BWB thinks other countries are leading the way, with SuDS becoming normal practice. There is

speculation as to what reasons are preventing the concept of SuDS from becoming broadly accepted. Many believe lack of funding and political will is to blame, but also pertinently, risk aversion fuelled by perceptions of insufficient evidence.

BWB notes how the legislative and planning characteristics of local authorities (LAs) and sewerage undertakers can complicate matters over connective policies on planning, regulation, approval and adoption. This is a concern shared by BM who notes that by not legislating, developers may believe that *“if we don’t have to do it we won’t”*. Many practitioners delivering exemplar SuDS would refute this by suggesting there is enough evidence now to suggest that SuDS can create better places and spaces.

“CIRIA has to be commended for providing training, keeping a constant dialogue and visibility around SuDS. I think susdrain is well respected and an excellent site as a resource and I think it is viewed as the premier source for SuDS information”.

Christopher Digman, MWH Global

BS sees CIRIA as being *“the main body to advance consciousness and understanding of SuDS within the UK”*. CD agrees that CIRIA’s role is one that *“maintains a constant dialogue around the theme of SuDS, highlighting and plugging knowledge gaps”*, while BWB views CIRIA as *“managing and encouraging further research, providing clarity and maintaining SuDS high on the political agenda”*. It is the collaborative nature and independence of CIRIA in delivering good practice guidance that BM believes is where the credibility of its outputs lie.

Question 3: Where are SuDS going in the next 10 years and what will be the critical issues facing practitioners and planners?

DB sees future uncertainty with adoption procedures, suggesting that there should be *“an adopting agency with the capacity and capability to adopt”* as a solution; something similar to the familiar and uncomplicated process for piped systems. He believes this may have failed in the hands of some LPAs due *“to the failure to enable legislation, but, more importantly, a failure to address the availability of the finance needed to secure long-term maintenance and renewal”*.

‘Seeing the light’ and ‘believers’ are common, almost biblical terms used by some to describe a

strong, but minority force of SuDS champions and designers. However, according to CD it is the ‘in-betweeners’ who really need convincing by having the right tools available to enable SuDS to be delivered effectively. He thinks water companies have great potential in developing a bigger role around SWM. Their strategic plans and frameworks for collaboration offer a platform to incorporate SuDS into their agendas. CD highlights the need for further evidence on water quality in terms of risk assessment from different land uses and the mitigation provided by SuDS components. This may well be significant, possibly in time for a third edition of the SuDS manual, something CD envisages happening within the next 10 years.



Figure 4 Rain garden formed, *Derbyshire Street pocket park, Bethnal Green, London (courtesy of London Borough of Tower Hamlets)*



Figure 5 Community planting, *Derbyshire Street pocket park, Bethnal Green, London (courtesy of London Borough of Tower Hamlets)*

‘Seeing the light’ and ‘believers’ are common, almost biblical terms used by some to describe a strong, but minority force of SuDS champions and designers. However, according to CD it is the ‘in-betweeners’ who really need convincing by having the right tools available to enable SuDS to be delivered effectively. He thinks water companies have great potential in developing a bigger role around SWM. Their strategic plans and frameworks for collaboration offer a platform to incorporate SuDS into their agendas. CD highlights

the need for further evidence on water quality in terms of risk assessment from different land uses and the mitigation provided by SuDS components. This may well be significant, possibly in time for a third edition of the SuDS manual, something CD envisages happening within the next 10 years.

While BWB thinks changes within the planning system will have a short-term impact, in the longer term she views strategic issues will arise from lack of physical space and therefore a perceived inability to implement SuDS. This may be compounded by increased pressure to build more housing very quickly. The critical issue will be getting SuDS onto the planning agenda from the start. This relates to BM's concern that planners need to become better informed about where and when to best to incorporate SuDS. BWB notes that it shouldn't be all about new development, but as equally about opportunistic 'nibbling' of hard surfaces and strategic approaches towards retrofitting, particularly in tight urban environments.



Figure 6 Completed scheme, *Derbyshire Street pocket park, Bethnal Green, London* (courtesy of London Borough of Tower Hamlets)

Question 4: How will changes to the regulatory requirements for SUDS impact delivery? How do you see CIRIA's guidance supporting this and what else can CIRIA do to support the delivery of the best SuDS possible?

Critically and at a much higher level there is a general belief that legislation and regulation need to be aligned better. Clarity over adoption and responsibilities for maintenance is considered as crucial, BS believes that interpretation of the Water Industry Act (WIA) 1991 differs from one Water and Sewerage Company (WaSC) to another, adding that *"it is essential that legal impediments to adoption by WaSCs are overcome and LPAs will need to work closely with LLFAs and WaSCs to*

provide a seamless and consistent process". DB sees the attractions in such a shift in policy around having *"a clear mechanism in place to ensure the necessary long-term finance to support maintenance and renewal"* as well as *"the required technical capability to manage the adoption process. As a result DB thinks SuDS would not be separated from conventional drainage, thus enabling mixed systems to be effectively developed and "planners and developers would be much more certain of what they needed to do"*.

"Although LPAs are well placed to ensure that SuDS are properly considered in the determination of planning applications, the ability of planners to assess complex information regarding flood risk might prove difficult, particularly where a developer and LLFA disagree about the viability of using SuDS within a development".

Brian Smith, Yorkshire Water



Figure 7 *Abode housing, Cambridge* (courtesy of Simon Bunn)

To deliver SuDS efficiently there is a need to consider the economics that can support the case for their implementation. Long-term management and maintenance is a critical driver behind whether SuDS will be implemented or not. CD believes that if an effective case can be demonstrated on how SuDS has directly increased the value of property and the developer has profited, then a major step will have been taken. In effect, financial accountability and affordability will determine whether SuDS get built. BWB states that practitioners need to *"talk to each other – the benefits of SuDS are numerous and so much can be achieved through collaborative working"*. In addition she notes that *"if well informed, it can be the communities that are the driving force behind a scheme"*.

While not mandatory, a shift towards planning for SuDS could bring multiple benefits and offer huge incentives for many stakeholders. As BM notes “it is the planning authority that hold all the key cards – they have the ability to make things happen”. BS believes that “many of the pieces of the jigsaw are already there. CIRIA can help galvanise relationships and partnerships through wider dissemination”.

Question 5: What do stakeholders need to do to position SuDS high on the priority list when new developments are being considered?

Working together to enable good practice is a common theme, and as BWB says “while the standards do not give SuDS full recognition, they do provide a minimum structure that can be added to and strengthened locally”. With support of the SuDS manual and BeST this is seen as a step-change. CD suggests a combination of good practice implementation and additional commitment by government, for example on the issue of right to connect, to effectively increase the uptake of SuDS. BS believes fundamental attitudes and cultures need to change, and to be truly effective he wants local champions within organisations to help build capacity, capability and ultimately confidence.



Figure 8 Water Colour, Redhill, Surrey (courtesy of Studio Engleback)

The experts concur that delivering good SuDS requires alchemy of the owing critical elements to enable their acceptance as an everyday occurrence in both new development and retrofit:

- Planners hold many critical cards they need to be well informed to make confident choices and decisions.

- The industry needs to talk more about SuDS – work together and collaborate.
- Processes for adoption need to be clear and straightforward for it to work effectively within the current planning framework.
- Water companies should seize opportunities to become better connected with SuDS – perhaps they could take on a SuDS adoption role to provide the simplicity and clarity that process needs at strategic as well as at local planning level.
- Government should review the possibility of having an independent agency for adoption processes.
- Continued research and funding is required on water quality, costs and benefits of SuDS, and improved monitoring of schemes.
- CIRIA need to continue fighting the good fight by accessing the ‘in-betweeners’, ie those who are ready to be convinced and informed about SuDS, and this will be where dissemination of the SuDS manual, BeST and susdrain should be focused.

“Time will tell how successful the recent changes to the planning system regarding SuDS have been. I don’t believe that they will make a great deal of difference, but I may be wrong. It will depend on how proactive developers turn out to be and how forward looking planning authorities are willing and able to be”.

Brian Morrow, United Utilities

CIRIA is now best placed to support these ideas through existing material, and through the new SuDS manual and BeST, as well as by offering guidance to its partners, LAs, planners and government agencies in appropriately responding to the recommendations outlined in the Pitt Review. The new SuDS manual and BeST, provide the tools to define, plan, construct, monitor, manage and maintain to take the ‘evolution of SuDS’ into its next 10-year period and beyond.

“In the longer term, the implementation of SuDS would make drainage overall much more sustainable and help to realise the multiple benefits that the new manual demonstrates can be delivered. This in turn would help England and Wales to more cost effectively meet its long-term goals for improved water quality under the EU Water Framework Directive”.

David Balmforth, ICE President

CIRIA is currently developing proposals to provide additional support to planners on SuDS ensuring they adequately drive their delivery. Mindful of the role of finance and incentives CIRIA is also looking for examples of delivery models to support approaches to cover the capital and operational and maintenance costs of SuDS.

To find out more contact Suzanne Simmons, CIRIA, on: suzanne.simmons@ciria.org or visit www.ciria.org

The updated SuDS manual will be available from CIRIA in the autumn of 2015.

References

The Pitt Review (2007)

<http://bit.ly/1AvUGMp>

Flood and Water Management Act (2010)

<http://www.legislation.gov.uk/ukpga/2010/29/contents>

Water Industry Act (1991)

<http://www.legislation.gov.uk/ukpga/1991/56/contents>

EU Water Framework Directive

http://ec.europa.eu/environment/water/water-framework/index_en.html