

## SuDS in the community: a suitable case for treatment?



In this briefing David Singleton, DSA Environment + Design Ltd, gives a brief account of the benefits of SuDS and indicates where success has been achieved and why this might be the case

### Summary

SuDS are starting to become well established as the approach to drainage design, both in UK and in other parts of the world.

At the heart of SuDS is the “SuDS triangle”, which introduces the notion that to be successful, SuDS design should balance the desire to control water quantity, improve water quality and provide amenity (and biodiversity) benefits. Case studies and a body of knowledge of the “physical” attributes of SuDS, ie dealing with water quantity and in large measures water quality, is being accumulated by the industry. Now, the time is right to concentrate on the third corner of the SuDS triangle “amenity”, and especially the engagement of local people.

Amenity would seem to be difficult to define, covers a range of aspects and is harder to get right than more physical SuDS functions. However, I’d argue that if it is not addressed properly, ultimately what we are trying to do with SuDS fails. There are many examples where this lack of consideration has resulted in an unbalanced, and ultimately unacceptable, scheme.

This CIRIA briefing follows an excellent briefing note by David Schofield on the work of Tom Liptan and others in Portland, Oregon. It offers accounts of some case studies, indicates where success has been achieved, and gives some indication of why this might be the case. I hope that by doing this other practitioners can develop their SuDS work further, avoiding some of the pitfalls and to seize the opportunity for SuDS and water to be an integral part of making more sustainable places.

### Introduction

The SuDS or sustainable drainage systems approach to the management of surface water is now well established in the UK. A SuDS scheme aims to do more than just deal with surface water “problems”. It is a new and, for some, revolutionary way to seize opportunities with water. It is a new way of thinking.

### The SuDS triangle

At the heart of SuDS is the SuDS triangle, which introduces the notion that to be successful, SuDS design should balance three functions: they should control water quantity, improve water quality, and provide amenity (and biodiversity) benefits. In doing this, SuDS design should aim to mimic natural drainage.



Figure 1 A recently completed SuDS scheme in Lusk, Ireland. While this pond contains the right storage capacity, it is hard to enjoy or even to relate to (photo taken by Anthony McCloy)

According to SEPA (2012): “By considering all three functions we should be able to provide adequate and well-designed systems that offer water quality treatment through natural process inherent in the system, encourage infiltration and where

appropriate attenuate peak flows [my emphasis] in addition to providing habitat and function for those using the area, including the local community and wildlife.”

It is clear that good SuDS design should be multifunctional. However, different situations would encourage emphasis to be placed on different parts of the triangle. Different designers take what they want from SuDS. Historically the emphasis in Scotland, as exemplified by SEPA is on water quality improvements.

As the amount of work done has grown, case studies have to be established, both in the UK and in other countries. SuDS knowledge is increasing. However, it still seems that many schemes concentrate on the physical functions, i.e. dealing with water quantity and water quality.

### Water quantity and quality

It is not surprising that dealing with two of the aspects of the triangle, water quality and water quantity, is emphasised. These aspects are measurable and can be pretty much defined. So it is possible to design (especially in the case of water quantity) to hit numerical targets.

### “Water amenity”

How to address the third function of the triangle, also termed “amenity (and biodiversity)”, is less clear. Design targets are difficult to set and outcomes can be vague. For instance, who can judge whether “success” is achieved? So often the amenity function of the SuDS triangle has been poorly addressed. Sometimes it is sidelined or even forgotten completely. The biodiversity aspect of SuDS, ie the value of the system to wildlife, is sometimes considered as part of amenity, although often it is not considered at all in design.

It could be argued that in fact the amenity aspect of sustainable drainage is vital and in many SuDS schemes would be the most important function of the triangle. To be sustainable, the approach should consider carefully how systems perform with time and how they fit into context.

The ongoing management of a system and its interaction with local people is crucial. Bringing people in encourages ownership, interaction and a much greater level of pride and enjoyment. Potentially, this gives considerable power to start to change the relationship people have with what they may not have given a thought to, i.e. what

happens with water. This can be seen as part of a general shift towards a greater awareness of resource use and a move towards a much more “water sensitive” mindset and a more sustainable lifestyle.

Case studies 1 and 2 show how designers have examined how this aspect of the amenity function can be used to reveal the exciting possibilities for stormwater management.

Dealing with people is, as most of us who have tried it will attest, more difficult than dealing with “things”. Seizing the opportunities that the amenity aspect of SuDS offers demands different skills than dealing with quantity and quality, although these aspects are interrelated. Also, it requires willingness on the part of designers to explore and create, and to engage communities over a much longer period of time than has been usual in the past. The opportunities are there because it is evident that failing to address the amenity aspect has resulted in poor design and schemes that have no richness, no appeal and possibly little relevance to anyone. Because of this, by any measure of what SuDS should do, they may not in fact work.

What a SuDS design looks like is part of its amenity function. But concentrating on visual appearance can be limiting. Amenity includes how people and wildlife interact with the scheme, and often this may be of greater importance than its physical form. How much local residents or works understand about how a scheme has evolved matters as much, if not more, than whether it is considered attractive.

### UK examples

In the UK, there have been many examples of SuDS practice attempting to involve, or even inform, local people.

#### **Commercial: Blythe Valley Park**

At Blythe Valley Park (or BVP), a large business development in Solihull, the local planning authority, Solihull Metropolitan District Council, has taken a leading role in framing the landscape management of the site.

An extensive countryside park surrounds the park and largely contains the SuDS, which is intended to act as a buffer between the business park and the River Blythe, a Site of Special Scientific Interest (SSSI). Development of BVP was started in 1999.

### Case study 1: Portland, Oregon, US

David Schofield (2012) discussed the pioneering work that was carried out in Portland, Oregon by Tom Liptan. This revealed far more than technical performance, but highlighted a shift in mindset across a community. Attitudes changed, which allowed a whole range of innovation to happen.

David considered a city-wide initiative, led by the local authority and a few main innovators, which resulted in much retrofitting of SuDS features, including rain gardens, disconnection of downpipes, swales and planting. Local people were engaged years before schemes manifested themselves on the ground, through a carefully constructed community outreach programme. This meant that a high degree of acceptance has been achieved. Portland's example still stands out.

People rarely live on commercial development such as BVP but neighbours live nearby and may use the site for years. Several thousand people work on the site and spend a great deal of their life there. There is a danger that for them the joys of the SuDS are remote and experiences may be fleeting. So a programme of engagement that over the years has included tours and trails has been instigated as part of ongoing landscape management.

Figure 2 shows how guided tours inform local residents and business park users about the countryside park, its management and the creatures to be found on the site, which features extensive wetlands, swales and ponds.

In commercial developments the local authority (approval body) has an important role to play to ensure engagement, because often these developments tend to be impersonal and professional. Potentially commercial sites cover

large areas and may be diverse. In these cases clearly framed planning conditions, for example requiring a landscape management plan, can assist in helping continuing engagement with local people and, to a large extent, control the quality of the work.

Publicity flyers and interpretation boards are periodically refreshed to encourage people to explore the SuDS landscape (see Figure 3, page 4). BVP Management Company, who run the park, have been successful in engaging local volunteers to carry out a range of activities, giving feedback on species diversity and greatly increasing public use of the park. This has the virtue of promoting BVP as a "good neighbour" and improving social safety and security.



Figure 2 Guided tours about the features of the countryside park, Blythe Valley Park, Solihull, UK

## Case study 2: Portland, Oregon, US

From the mid-1990s onwards in Australia SuDS, or the wide-ranging Water Sensitive Urban Design (WSUD), has been enshrined in planning policy. A good example of how this initiative has been used is in Kotara, a suburb of Newcastle in New South Wales. The Kotara Sustainable City overarching programme was launched in tandem with Lake Macquarie Council, to link several different initiatives including WSUD (Morley, 2012).

Part of the work concentrated on WSUD improvements and retrofit of features. Examples include retrofitted wetlands, creek rehabilitation, water saving measures and a variety of educational exercises.

Photograph 1 is an interpretation board explaining the rehabilitation of the creek in a powerfully graphical style that even small children find engaging. The work was partly done by local people, guided by a council landscape architect.



Photograph 1 *An interpretation board explaining the rehabilitation of the creek. This work was partly done by local volunteers, Black Duck Creek, Kotara NSW*



Photograph 2 *You cannot move without interpretation! This board explains the rehabilitation of the creek on the fencing during the works, Styx Creek, Kotara NSW*

Photograph 2 shows a board explaining the rehabilitation of the creek is on the fencing during the works. It is impressive to see such clear and informative signage, even during the process of the works.

Photograph 3 shows the rehabilitation of the creek as it leaves Nesbitt Park, highlighting the difference between the restores Styx Creek and the former storm drain.

The long-term aim is to encourage a gradual shift in behaviour, by winning hearts and minds. It could be argued that the initiatives are a little disjointed. However this may be because of the various different agencies involved in delivering projects. The authorities' shift in position, led by policy changes at Federal and State level, is clear.



Photograph 3 *Rehabilitation of the creek as it leaves Nesbitt Park, Styx Creek, Kotara NSW*



Figure 3 *Publicity flyers and interpretation boards are periodically refreshed to encourage people to explore the SuDS landscape, Blythe Valley Park, Solihull, UK*

### Healthcare: Moor Park Health Centre

Moor Park Health Centre is a large building set into a public park in north Blackpool. It was completed in 2011 by LSP Developments and Blackpool Council. The need to integrate the development, which is large and contains a leisure centre, library and several GP surgeries, together with an extensive car park into the existing park demanded an innovative solution, part of which became SuDS. A main opportunity in health schemes is the involvement of some of the most authoritative locals, ie the medical professions. People may not listen to the council (especially if they are disengaged anyway) but they may listen to their doctor.

The proposal involved the creation of several children's play areas, which offered the chance to engage two primary schools. It was realised that putting water into a park that at the time had none may be a concern. It was felt that they would be the ones benefiting most from the development, and both schools responded positively. The first step was to carry the message into the schools, to ensure that they understood what was trying to be achieved. A similar message was carried to the distinctly more formal neighbourhood forum. Unfortunately, many elderly people had fairly fixed ideas, which produced more mixed results especially at the start. However, the children's enthusiasm is helping (see Figure 4).

As time went on, and momentum increased, greater levels of success was achieved, and understanding of the particular nature of the scheme spread. Even some of the children helped in carrying out the work of planting in the swales (see Figure 5 and Figure 6, page 6).

Shortly after the scheme was completed, the developer received complaints from drivers (most of them elderly) who had mistakenly selected the wrong gear and driven their car into a swale. This prompted demands from the building manager to fill the swales in. To address this, apart from detailed explanations of why the swale system was so important, the design team produced more interpretation, in the form of flyers and posters, to further inform people why the novel solutions had been adopted on the site (Figure 7, page 6). These are distributed through Blackpool Council to staff at the library and leisure centre as well as all the GP practices in the new Health Centre. Larger posters were printed for the foyer of the main building.

At Moor Park, SuDS and design with surface water is part of the wider making of place, and the creation of a healthy landscape. To consider the water in isolation can lead to opportunities for integration to be missed.

Moor Park is a CIRIA SuDS case study: [www.ciria.org/suds](http://www.ciria.org/suds).



Figure 4 *Explaining to local school children how SuDS works and how they might be involved in the project, Moor Park*



Figure 5 *Children planting swales in the doctors' rain garden at Moor Park, a year later*



Figure 6 Children from Moor Park Primary School planting wetlands at Moor Park, as part of curriculum work to learn about ecology

### SuDS in school 1: Bushloe High School

Bushloe was one of the first SuDS schools, in Leicestershire, being completed in 2006. It features a comprehensive swale system at the front of the school and is a CIRIA SuDS case study.

Considerable effort was put into consultation and engagement during the design phase with the school community, led by Willmott Dixon as main contractor, explaining to staff the benefits of SuDS as an outdoor learning environment. This was enshrined in a planning condition. This was successful and when by chance, staff arriving in the summer holidays, discovered a swale being filled in to ease maintenance they were galvanised into action (see Figure 8). Their complaints succeeded in repairing the damage. Since then curriculum work has been carried out in the SuDS. Because the staff understood the purpose of the swales and were looking forward to using the SuDS landscape for teaching and learning, they were sufficiently motivated to protect it. Since then the swale system has become one of Bushloe's unique features, and further money has been spent on constructing dip netting platforms and a range of other features. The school even records rain events often published online (ecoclubatbushloe, 2009).

Bushloe High School is a CIRIA SuDS case study (2012).



Figure 7 A poster explaining how SuDS fit into the wider park design at Moor Park



Figure 8 Mark Batchelor, geography teacher at Bushloe High School, explaining how he and his colleagues use the SuDS in teaching

### SuDS in school 2: Forest Way

At Forest Way, a special educational needs school in Coalville, Leicestershire, maximising the teaching value of the grounds was a major feature of the brief. Again, SuDS are part of what can be achieved. The attenuation basin was designed to be wheelchair accessible. In large measure, it is an amenity, rather than attenuation feature.

The attenuation basin is regularly used for dip netting and children from local schools have carried out science projects in the pond and surrounding grasslands. The hide allows the basin to be used as a focus for bird watching (Figure 9).



Figure 9 *The children maintain the attenuation basin at Forest Way School*

### **SuDS in school 3: Melton Vale post-16 centre (MV16)**

The building of the first purpose-built post-16 centre in Leicestershire, offered the opportunity to develop the ideas used at previous new build schools.

Traditionally it has been relatively easy to introduce ponds into primary and high schools, but doing so in a sixth form environment was unusual. The extensive SuDS approach helped with above-ground swales and basins that proved to be more affordable than an intensive alternative. All that remained was to convince the staff. In this case other local school sites provided precedents that were very important (Figure 10).

At MV16, the curriculum has been modified to allow students to use the SuDS landscape for study. This is in its early stages, but post-16 level interaction is offering the chance for students to provide data on the performance of the system and influence management. Again, the integration of SuDS into a wider landscape and building systems that are sustainable are profoundly important.

MV16 is a CIRIA SuDS case study.



Figure 10 *Staff at Melton Vale on a tour of the grounds to point out features of the SuDS*

### **General conclusions**

Making the third amenity function of the SuDS triangle work can be difficult, but that is not to say that it is not valuable. In fact addressing amenity in some way is necessary to achieve the overall aim of any sustainable system. Without consideration the scheme is in danger of having no relevance to people, local or otherwise. Engagement Involvement (also known as outreach in Portland) can help in this. However, each scheme will be different and this is where study of what has been achieved elsewhere could be useful.

The professional design team have a vital role to play. Similarly, the local authority can assist in framing the design and providing local context.

Planning authorities and SuDS Approval Bodies (SABs) should recognise that well-rounded SuDS achieve a balance across functions, and have a duty to ensure that these are addressed in the move towards a more water sensitive world.

The landscape management plan (LMP) stands out as a useful tool in addressing long-term management, especially in larger scale or commercial developments where there is less personal connection with the site.

Where this is not a condition of planning, the dangers of not having ongoing professional input and guidance are greater. The trend would be for general ignorance to lead to at best neglect and at worst regression.

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