

## Forest Way School, Coalville



Fig 1: Immersive learning on the topic of biodiversity

### SuDS used

- *Swales*
- *Attenuation basin*
- *Emergency overflow*
- *Rainwater harvesting for grey water system*
- *Small attenuation tank*

### Benefits

- *Slower rates of ground water run-off from site*
- *Increased biodiversity*
- *Outdoor learning greatly enhanced*

## 1. Location

Forest Way School  
Warren Hills Road  
Coalville  
LE67 4UU

## 2. Description

Forest Way School is a Special Educational Needs (SEN) school located in Leicestershire. Pupils range from the ages of 3 to 19 years and are taught key stage curriculum and post 16 courses. The school is also located within the National Forest and the site itself has a small woodland area, planted originally by children of the Castle Rock High School, which occupied the site previously. These features are reflected and utilised by the school's Forest School programme attended by all ages.

The project's brief, provided to designers, was that the SuDS was required to have a creative approach to managing surface water run-off and coping with the site's steep clayey ground, all while encouraging increased biodiversity and providing teaching space.

## 3. Main SuDS components used

Little underground drainage was used except for proprietary kerb drains and filter drains located close to the building, and some pipes where levels dictate, all of which directed water into swales. A long swale conveys water from the north of the site to the site's main attenuation basin. The rate at which water discharges out of the system and into a 225mm private drain is controlled by an orifice plate.

## 4. How it works

SuDS used on this scheme were required to work with a substantial level change of 9m between the top and bottom of the site. The site itself was constructed to comprise of school buildings, hard and soft surfaced play areas, surrounding earthworks. As it was deemed not suitable for the site to support infiltration drainage i.e. soakaway, an above ground drainage system was decided upon.

The scheme is designed to safely manage a 1 in 100 year plus 20% for climate change return period storm and discharge from the basin into the private drain at approximately 25l/s. Run off is taken from the building's roof and paved areas and directed into either a swale, pipe or gully where water is then conveyed to an attenuation basin. Swales are approximately 159m in total and are very shallow. They also contain small rock baffles to keep velocities to a minimum.

## 5. Specific project details

Before 2009 and the construction of the SuDS, surveys revealed the site had low ecological value and no wetland site was present. The SuDS was required to deliver a system that slowed the rate at which surface water run-off left site through a private drain, while providing a landscape for educational purposes. Today the SuDS is mature and has fully incorporated itself into the land, supporting a variety of plants including shrubby species like goat willow, marginals like soft rush, and reed mace and water plants like mare's tail and starwort.

## 6. Maintenance & operation

The school staff report that the SuDS requires very little maintenance, however, an important consideration from the outset was to enable (and encourage) interaction with school staff and students. Unusually, Forest Way members of staff have taken this further than is typically the case, as Post-16 students are employed, as part of their school work and preparation for life outside

school, in landscape work. This ensures that the watercourses and swales are kept clear of obstructive vegetation and that students learn about SuDS. Importantly to enable students to carry out studies in the permanent water areas, invasive reed mace and pond weeds are cleared periodically.

## 7. Monitoring and evaluation

The school has a Forest School programme associated with it and this supports its continuous monitoring and evaluation. The Forest School programme runs throughout the year in all weathers, with the support of teachers who feedback on the site's development to DSA Environment + Design, the landscape architects.

## 8. Benefits and achievements

The SuDS ability to support increased biodiversity at the site provides a great learning resource for the school's children to get involved in Forest School activities. "By participating in engaging, motivating and achievable tasks in the woodland and SuDS environment, each pupil has the opportunity to develop motivational, sound emotion and social skills", quotes Forest Way School.

The head teacher from Forest Way School was engaged in the development of the SuDS and its success and personally went on to achieve an OBE, of which was possibly supported by the school being voted 'Best School' when opened and becoming a National Teaching School. Further compliments include "Forest Way is a template for education in England in the future", says Chief Executive of the National College for Teaching and Learning (January 2014).

Furthermore, CIRIA produced a short film, 'The Story of SuDS and Forest Way School' with input from students and staff, in 2017. <https://www.youtube.com/watch?v=3dw3MxzDtmg>

## 9. Lessons learnt

Headwalls to drains were constructed using low height gabion walls to contain water in higher areas of the site while being aesthetically pleasing, however, once constructed it did not serve its intended purpose and instead allowed water to leak from it at an insupportable rate. Features to contain water serve an important purpose on a site with such substantial level change and were a challenge this site had to overcome but were done so with a sub-optimal solution. This sub-optimal solution included a small proportion of the drainage being treated conventionally.

It was also essential to provide reassurance to members of the school on safety and maintenance concerns. Much of this was done by carrying out visits to previously installed Leicestershire schools with SuDS and speaking to premises officers and staff.

## 10. Interaction with local authority

Leicestershire County Planning and the Environment Agency supported the SuDS approach at Forest Way School.

The school and authority have continued to support two further enhancement schemes at Forest Way School (after the original build). The first of these involved the creation of an enhanced 'Outdoor Learning Environment' with more features to enable interaction with the water system, including a small bridge and more all-weather access paths. The latest addition is an extended car park, draining into the existing system by means of a permeable pavement and sub-surface attenuation using sub-base. Both schemes were designed by DSA Environment + Design, the latter with engineering input from THDA.

## 11. Project details

**Construction completed:** SuDS and entire project completed in 2009

**Cost:** Overall project: £8,260,000

SuDS: The inclusion of the attenuation pond was a circa £45,000 cost saving compared to conventional surface water drainage what would have been suitable for the site.

**Extent:** Entire development site is approximately 2Ha including SuDS

## 12. Project team

Funders	<ul style="list-style-type: none"> <li>Leicestershire County Council</li> </ul>
Clients	<ul style="list-style-type: none"> <li>Forest Way School</li> </ul>
Designers	<ul style="list-style-type: none"> <li>DSA Environment + Design</li> <li>Arup</li> </ul>
Contractors	<ul style="list-style-type: none"> <li>Willmott Dixon</li> </ul>

## 13. Site images and illustrations



Fig 2: Mature SuDS



Fig 3: SuDS shortly after construction and un-vegetated



Fig 4: Immersive teaching amongst the mature SuDS



Fig 5: SuDS Filming on location at Forest Way