England's Best Kept SuDS Secret

A Stormwater Case Study

Project Profile

Objective

Control and attenuation of surface water runoff where the site conditions precluded infiltration.

Solution

The landmark SuDS scheme was enabled by the use of 18 Hydro-Brake® Flow Controls to provide balancing and buffering of the surface water runoff.

Product Profile

- Reduces stormwater storage requirements by up to 30%.
- Up to 50% savings in project costs.
- Self-activating and self-cleansing with no moving parts or power requirements.
- Area of opening is 3-6 times larger than the equivalent orifice.
- Virtually maintenance free.

The new WRc and BBA approved Hydro-Brake Optimum® is now available. Find out more at **www.hydro-int.com**

A pioneering drainage scheme on a Hampshire housing development, acclaimed as a national example of good practice, was only made possible by 18 of the country's best-kept SuDS secrets.

The 1900-home Elvetham Heath development at Fleet is hailed as a shining example of Sustainable Drainage Systems (SuDS) using linked swales and ponds. It is featured in the Government's seminal Response to the Pitt Review, the forerunner of the Flood and Water Management Act.

But what the report does not point out that it is the performance of 18 Hydro-Brake® Flow Control devices that enables the SuDS scheme to operate successfully.

Ryan Lundy, senior civil engineer for Bradbrook Consulting worked on the design: "People see the numerous swales and large ponds when walking or driving around Elvetham Heath but probably don't appreciate that many of them are interconnected. The strategically placed Hydro-Brake® Flow Controls provide balancing and buffering of the surface water runoff. Across the whole site the runoff is regulated by gravity and the storm water drainage strategy is achieved without the use of pump stations"

"The drainage system is performing well and we have not been aware of any flooding incidents, despite severe stormwater conditions in the South of England including in 2007," he added.

Built during the late 1990s by Persimmon Homes, the Elvetham Heath site was developed over sandy soil, which offered some infiltration through soakaways at the top of the site, but none at the lower end.

To protect against surface water flooding, the Environment Agency required runoff rates from the impermeable surfaces of 2.72 litres per second per hectare, representing a 1 in 50 year event - a standard requirement at that time.

In addition, the drainage solution needed to protect an area of the site designated as a nature reserve both during the construction phases and beyond. The eco system of the nature reserve was required to be protected because of rare fauna growing in this location. The nature reserve was identified as being sensitive to nutrient overload, flooding and sediment so a way of regulating the surface water runoff into this area was crucial.

The Elvetham Heath development is built to a housing density of between 30 and 50 dwellings per hectare. Together with its network of access roads and pathways the site placed significant constraints on the amount of space available for larger drainage features.

Setting aside more land for large pond containment was not feasible. So smaller SuDS features protected with strategically located Hydro-Brake® Flow Controls were designed to attenuate the flow of surface water. In this way, the lower levels of the site and the discharge into the watercourse were not overloaded.

The need to control sediment and maintain water quality was met by planting reed mace in the swales. But, if conventional control devices such as orifice plates had been used, they could quickly become blocked by vegetation – leading to frequent maintenance requirements.

"The Hydro-Brake® Flow Control has a large outlet diameter compared to an orifice plate, which means it will not become blocked by vegetation. Constant maintenance is, therefore, not an issue.

"In addition, its hydraulic efficiency ensures that the space required upstream to provide the required storage volume is reduced."

Alex Stephenson, Stormwater Director for Hydro International said: "We are very proud that Hydro-Brake® Flow Controls have been used in such a prestigious development, which has been widely acclaimed as an exemplar SuDS scheme for housing developments.

"The natural features of the drainage solution were only made possible through the enabling technology of the Hydro-Brake® Flow Controls. The development provides a true example of how an appropriate mix of techniques and technologies can be applied successfully to engineer in nature's way."

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