

Case Study

Eastern High School, Cardiff

SDS installs the UK's first Aqua-Filter™ stormwater filtration unit



SDS Systems

SDS Aqua-Filter™ Filtration Unit, SDS Aqua-Swirl® Separator, three GEOlight® Attenuation Tanks.

Client

Wilmott Dixon.

End Customer

Cardiff Council.

Project

Construction of a new high school and further education centre, funded by Cardiff Council and the Welsh Government as part of the £164 million '21st Century Schools' upgrade programme across Cardiff.

Purpose

To create an inspiring educational environment, providing a smooth transition for high school leavers to continue in further, post-16 education and training on the same premises.

To provide additional leisure and learning facilities to the wider local community.

Brief to SDS

To ensure the site remains flood risk free and to prevent the pollution of local water courses.

Timing

Construction of the new £26 million school commenced in October 2016; it is scheduled to open in January 2018.

Project Background Information

Eastern High School is a new centre for secondary and further education, replacing the former Rumney High School which was demolished to make way for the new, much larger premises.

Built on an innovative shared learning campus the scheme has been developed in collaboration with Cardiff & Vale College. The new school will accommodate 1200 pupils with a further 320 students in the College.

Project Objectives

To effect the fast and efficient removal of surface water from the site and to ensure its safe dispersal to natural water receptors.

Project Requirements

Works were carried out in an environmentally sensitive location with measures taken to protect the existing development from pollution and damage during both demolition and construction.

Surface Water System Requirements

Consultation with Natural Resources Wales (NRW) established that there should be no water pollution into the Severn Estuary during building work. Furthermore, the surface water drainage should be connected to an existing outfall structure which lies on the boundary of the Gwent Levels Site of Specialist Scientific Interest (SSSI).

Any development, therefore, had the potential to adversely affect the special interest within this SSSI. Any additional surface water runoff volume required NRW International Drainage District (IDD) Land Drainage Consent, which encompasses stormwater storage and flow rates, estimated in line with the well documented impacts of climate change (i.e. 1 in 100 years + 30%). NRW also required that water discharges meet quality conditions and that the scheme should include provision for regular monitoring of water quality including visual checks, in order that a Water Discharge Activity Permit could be supplied for the duration of the demolition and construction works.

SDS Product Features

The SDS Aqua-Filter™ filtration unit maximises the removal of suspended solids by up to 80%, nutrients, heavy metals and hydrocarbons, from the surface water runoff prior to onward conveyance; it also helps to eliminate 40% of total phosphorous. Aqua-Filter™ is used as part of a complete water management programme, connected upstream to an Aqua-Swirl® separator and downstream to a GEOLight® stormwater attenuation system. It provides a high level of water quality treatment through the use of the Aqua-Swirl® chamber for pre-treatment, followed by a filtration chamber for secondary treatment.

Capacity

SDS Aqua-Filter™ model AF-X2, as installed for this project, has a filtration treatment tank measuring 3.7 metres in length and is equipped with 2 filter rows, providing a filtration rate of 28 litres per second. The treatment flow rate of the Aqua-Filter™ system is engineered to meet or exceed the local water quality treatment criteria and form an intrinsic part of the SuDS solution train.

The SDS Aqua-Swirl® separators are designed to remove more than 80% of the total pollutants in the surface water runoff volume. Model AS-2, as fitted here, has an oil/debris and sediment storage capacity of 140 litres and 0.28m³ respectively. The three SDS GEOLight® geo-cellular attenuation tanks have the combined capacity to store up to 1,950m³ of water that has already been treated.

Issues Overcome

Latest SuDS guidance requires planners to incorporate the management of the SuDS water quality devices into their designs. This can be facilitated by specifying manufactured devices upstream of vegetative devices so that proactive scheduled maintenance can be carried out quickly and easily. SDS Aqua-Filter™ and Aqua-Swirl® have the capacity to limit the amount of silts and attached pollutants from building up in the upper layers of a wider SuDS system and to mitigate against the ability of pollutant bioaccumulations to remobilise in the event of a surge of water, such as after a torrential downpour.

In line with the European Water Framework Directive (WFD2015), water polished by Aqua-Filter™ can be discharged into the most sensitive of water courses.

Ed Hoskins, Senior Associate, Cambria Consulting Ltd, said: *"This project required stringent control of surface water quality given the sensitive nature of the receiving watercourse in a SSSI. This level of water quality treatment could not be achieved by standard proprietary installations. Following extensive investigation, we identified a solution that we were previously unaware of. Having found the answer we were looking for in SDS's new hydrodynamic vortex separation and filtration system we are proud to have installed the UK's very first Aqua-Filter™. Following successful pre-installation testing we are eagerly anticipating the first set of results of the system in situ."*

