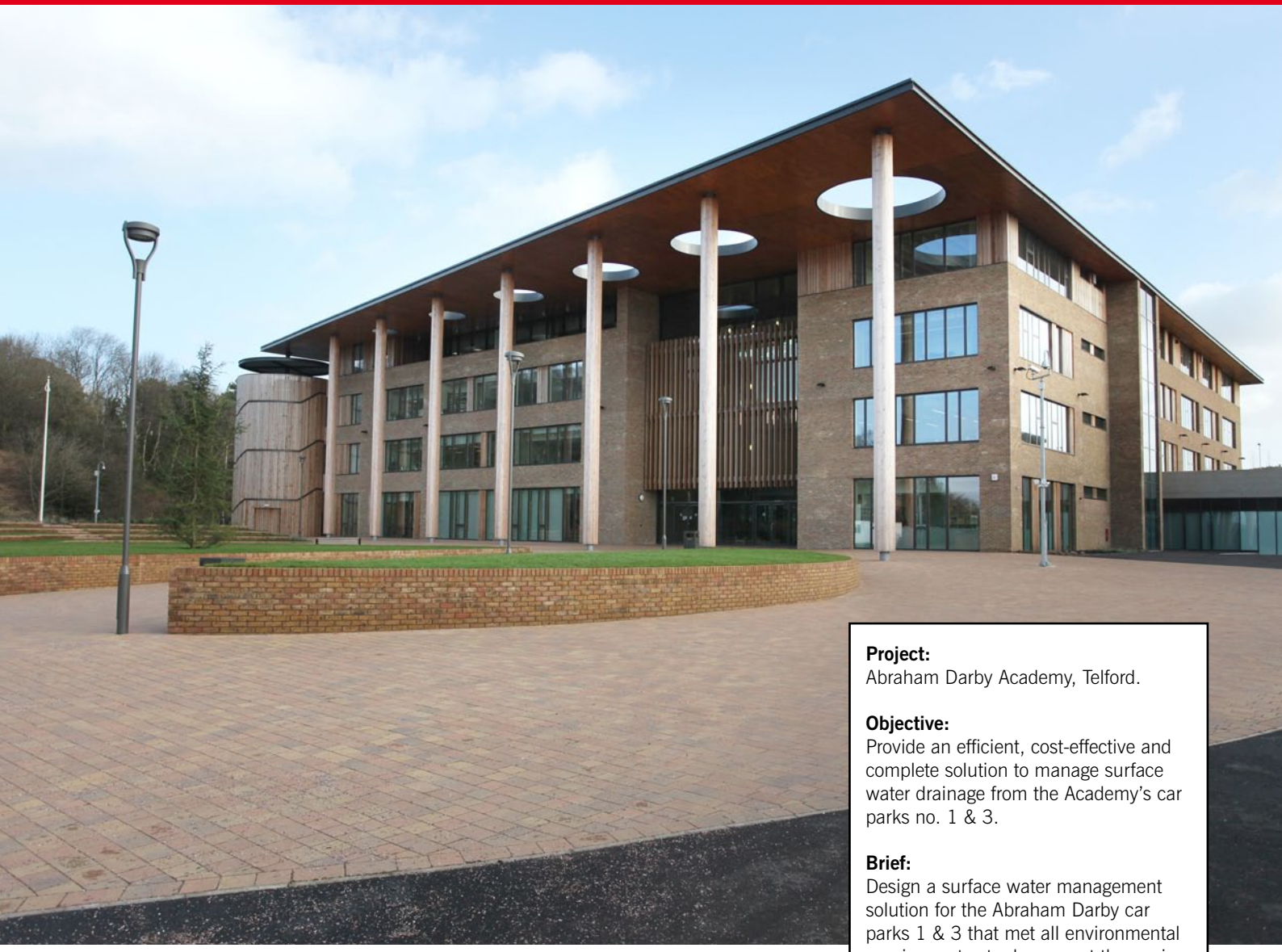
ACO Water Management

Abraham Darby Academy Telford

ACO's surface to outlet drainage solution delivers cost savings at new teaching facility.



Project:
Abraham Darby Academy, Telford.

Objective:
Provide an efficient, cost-effective and complete solution to manage surface water drainage from the Academy's car parks no. 1 & 3.

Brief:
Design a surface water management solution for the Abraham Darby car parks 1 & 3 that met all environmental requirements at a lower cost than using porous paving, as was applied on car park no. 2.

Solution:
A complete solution using ACO's Collect, Clean, Hold and Release programme.

Results:
A lower cost, efficient drainage solution incorporating all elements required including water collection, treatment of polluted water, attenuation and controlled water run off. Simplified project management through the use of ACO as a single supplier; reduced waste removal and easy installation.

The new Abraham Darby Academy was developed as part of Telford's Building Schools for the Future scheme. It is a state-of-the-art teaching facility, designed for the 21st century, for pupils aged from 4 to 18, with a new primary school and leisure facility on the site. The Academy provides teaching space for 1,100 students, plus a sixth form facility, and the primary school can accommodate 400 pupils. The leisure centre includes a swimming pool, a four-court sports hall, fitness suite and changing facilities.

The project started in May 2010 and the primary school opened to pupils in January 2012, followed by the Academy in July 2012. Extensive car parking was required to support this impressive facility. Kier invited ACO Water Management to provide a sustainable drainage solution for the management of surface water in car parks 1 & 3, as a cost-effective alternative to the porous paving solution that had been used in car park no. 2, and which had incurred high construction costs.

ACO met with the project team, and proposed a complete solution using its Collect, Clean, Hold and Release drainage systems' principle. This concept's four stages begin with the efficient and effective collection and conveyance of surface rainwater. The water is then cleaned using a hydrocarbon separator. This system processes problematic substances such as silt, and removes pollutants such as oil with its potential to seriously damage the environment into which the water is released.

Following cleaning, the water is stored to await a controlled discharge – ACO's storage solutions include the ACO StormTank, which can be operated in conjunction with swales and ponds, or used independently. Finally, the water is released into the environment via an ACO Q-Brake vortex flow control, which is designed to provide a measured discharge; this in turn allows the system to fill the StormTank attenuation units.

ACO worked closely with Kier to ensure that all design criteria were met, and to show the versatility of the ACO product range. On review of the proposal, ACO products were selected, as Kier saw significant cost saving benefits in the solution, and so they were duly applied in car park no.3. Due to the topography on car park no.1, it was not deemed cost effective to alter the solution applied there from porous paving.

ACO MultiDrain M100D was used at various points across the site to provide surface water drainage.

Scope of Supply

The car park area at the academy covered around 3000m^2 and the ACO proposal provided all the products needed for management of its surface water. The total solution offered Kier considerable cost savings over the originally proposed porous paving design, and produced a complete and reliable water drainage solution that was easy and efficient to install.

Over 100 metres of Qmax 350 slotted channel system was used to provide slot drainage to the car park. This versatile product is manufactured from lightweight recycled Medium Density Polyethylene (MDPE), to give a robust solution that was easy to handle and install.

Environmental regulations

ACO Q-Ceptor hydrocarbon bypass separator technology was used to treat polluted surface water to performance Class 1 (less than 5mg/litre of oil under standard test conditions.) These high performing units ensured compliance with environmental regulations and, with an innovative single chamber design, provided a compact solution – reducing excavation and installation costs for the project, and ensuring the effective management of factors such as silt deposition.

Two ACO StormTank structures (107m^3 and 430m^3) were supplied for attenuation of surface water run off. In the manufacture of StormTank, a lightweight modular cell system providing a 95-97% void ratio, significantly reducing the required volume compared with the 30% void ratio for the proposed porous paving. The innovative design allows for easy maintenance and inspection as well as preventing silt build up and blockages.

An ACO Q-Brake Vortex was supplied to control the release of surface water discharge into watercourses. The unit installed provided 30 l/s flow with features to ensure predictable control performance, easy installation and maintenance.

Approximately 260 metres of ACO MultiDrain M100D channel system were also supplied for use on pathways and other hard landscaped areas around the Academy.

ACO MultiDrain Brickslot provides discreet slot drainage to hard landscaped areas.

ACO Qmax provides surface water drainage to car park no. 3.

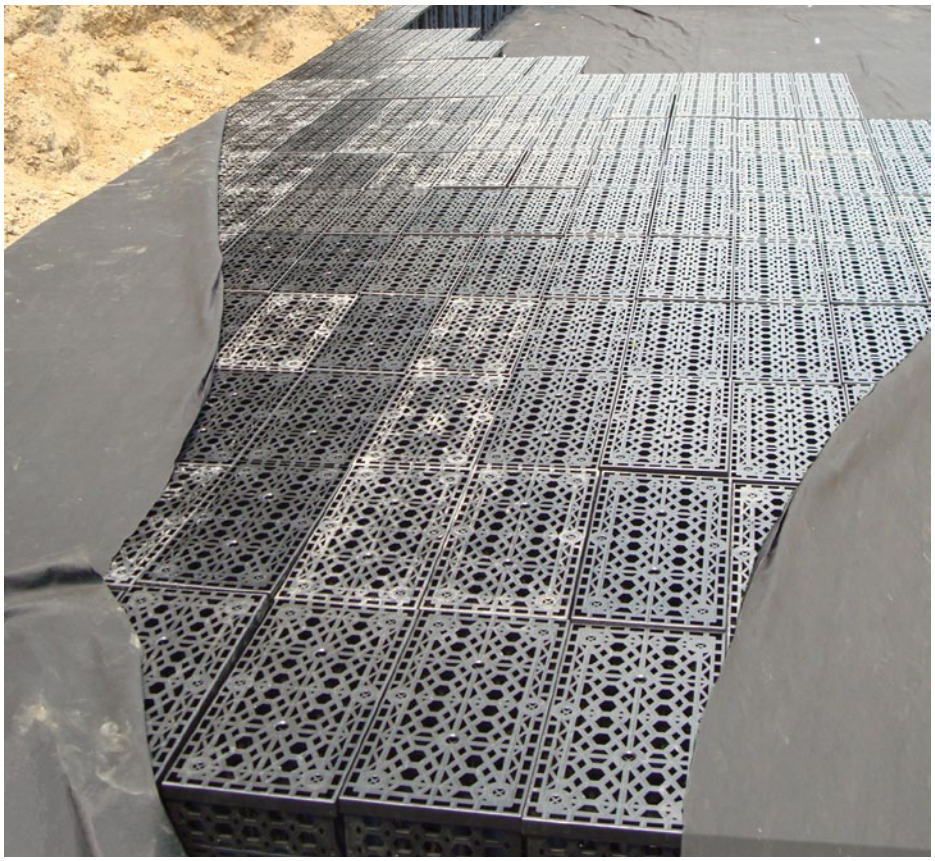
Key challenges for the project

The key challenge for this project was to provide an efficient, effective and reliable surface water drainage system, meeting all environmental requirements and regulations for the car park, and doing so at a reduced cost compared with the equivalent porous paving solution. Having a single company supplying all components for the system helped ensure a smooth running project with continuous and reliable assistance provided by ACO throughout all phases. This greatly simplified the project management and ensured all parties were fully supported, including the project coordinator, design coordinator, quantity surveyor and site engineers.

Reduced cost and easy installation

ACO provided the complete surface water management solution, supporting Kier to ensure an efficient and reliable system. The use of the lightweight and robust products ACO offer ensured fast and easy installation of the drainage system. ACO worked closely with Kier to meet all requirements for the project and ensure everything ran smoothly from approval of designs to installation of the products. The reduced installation requirements, waste management and product costs delivered around a 30% saving compared with the original porous paving design.

Graham Tait, Senior Project Engineer at Kier, commented, “A design with porous paving might have worked well but the installation costs were very high, in particular for the amount of excavation and cart away required. The ACO design made good commercial sense for the car park and the support ACO provided helped this project to run very smoothly. The products were quick and easy to install and dealing with a single supplier was a real benefit.”



Installation of ACO StormTank provides surface water attenuation.

The ACO products use recycled materials to provide an environmentally sound solution and their compact, lightweight design further reduced the carbon footprint for the solution with less need for shipping of both materials to the site and haulage of waste material away.

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