

RAINWATER HARVESTING AT THE WESTFIELD SHOPPING CENTRE

The Challenge

With more than 21 million annual visitors, 7000 employees and 200 public toilets at London's Westfield shopping centre each year, the challenge for the architects and constructors was to look at ways in which improvements can be made to the site's environmental performance. Here we examine how intelligent water management specialist, Aquality Trading & Consulting, was able to introduce a rainwater harvesting system that could radically improving the environmental performance of the shopping centre and deliver payback in under five years.



The Solution

Aquality became involved with the Westfield project in 2005 when invited to look at the existing plans for the rainwater harvesting element of the build. Aquality's objective was to help re-design an existing rainwater harvesting system that could supply water to all of the 200 public toilets in Westfield. The site already had two 2,000m³ attenuation tanks, for flood control, to help delay the run off of rainwater into the sewer. As a result, Aquality was able to tailor these existing facilities by combining the attenuation tanks with the storage tanks for the rainwater harvesting system – effectively creating a tank that would utilise the storage volume of the existing attenuation units. This literally made the two systems into one. As a result, instead of discharging into the sewer, the content of the attenuation tanks could be pumped into the building to flush the toilets and feed the urinals. The company also supplied a pump and control system and some additional filtration to help achieve the necessary flow of water.

The equipment for the Westfield rainwater harvesting system was supplied in June 2008 and it was installed by accredited Aquality installer the Pims Group. As well as dealing with design issues like confined space access and a partially "green roof", Aquality had to be certain that the system would

be failsafe in case of any breakdown. Aquality supplied mains water back-up Aqua-Control 5000 rainwater harvesting control unit, with integrated break tank, variable speed booster pump set and a built in electronic control unit – to both monitor water levels, filtration requirements and pumping facilities to supply all the site's toilets. The Aqua-Control 5000 is ready wired and easy to use and is modular, which means the system can be expanded to operate with much larger levels of demand.



The system the company ultimately supplied, switches to mains water if there is any problem or if the rainfall levels haven't been sufficient to fill the tank. The solenoid valve of the mains water back-up system is regularly and automatically opened to avoid stagnation in the mains water pipe. Furthermore, unlike many other systems, it doesn't incorporate a header tank in its design,

thus avoiding the pressure and pipe work problems inherent in such a project. The need for a header is obviated by the use of three integral pumps, which provide redundancy should one of them fail.

Results

This system bought immediate savings to the rainwater harvesting system of approximately £70,000 as there was no tank building requirement. Furthermore, the filtration system and Rain manager control unit for the rainwater harvesting project was eligible for the Enhanced Capital Allowance scheme, effectively reducing its cost by 30%.

Pims provided 24/7 maintenance back up, while Aquality offered remote monitoring on the system. As well as ensuring maintenance is timely this also means the performance of the unit can be monitored. Furthermore, the system can also report to Westfield's own facilities managers remotely, allowing for close monitoring of return on investment.



It was initially estimated that, using this technology, £612,000 could be saved during the 30 year lifespan of the unit. The final figures may well prove to be higher than this, largely thanks to the improvements made to the design during the installation process.