

# Case Study

Porous asphalt

## Withywood Community Centre Car Park, Bristol

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| Client:    | <b>Hartcliffe and Withywood Community Partnership and Bristol City Council</b> |
| Architect: | <b>Quattro Design</b>  |
| Product:   | <b>Porous asphalt pavement system</b>  |

### Project Brief

Architects Quattro Design who specialise in residential, community, health and education projects were contracted to design a 2,000m<sup>2</sup> car park at the Withywood Community Centre in 2006, choosing Tarmac's Porous Pavement System to meet the sustainability requirements of the brief and minimise the impact of the development on the local environment.

The car park, completed in 2006 serves the Withywood Centre in Queen's Road, Bristol, which had been built by a community-led design-and-build team including representatives from South Bristol Church and Community Trust, the local Primary Care Trust, the Hartcliffe and Withywood Community Partnership and Bristol City Council. The centre provides services and facilities for local people, including a youth centre, healthy living centre, two cafes, advice centre, church, crèche and venues for hire.

This design collaboration resulted in the inclusion of a number of environmentally focused design features for the Centre including a porous asphalt car park with an in-built weir system, which forms part of the reservoir layer providing increased storage capacity; and inlet pipes to transfer rainwater from the 2,500m<sup>2</sup> roof of the community centre into the porous pavement.





## Comment

Chris Goodsall, project manager for Quattro Design at the Withywood Centre in Queen's Road, Bristol, says: "It was a key part of our design brief to create a parking area that was not only environmentally friendly, but also capable of storing thousands of litres of rainwater as a sustainable solution for the new community centre. Working alongside Tarmac's National Contracting team, we were able to achieve this by using Porous Pavement. In addition to the environmental benefits it delivered for the local community, there were also cost saving benefits when compared to permanent traditional drainage systems. This innovative car park is working well and helping to protect the local community from the potential risk of localised flash-flooding."

## Withywood Community Centre porous asphalt system

### Background

The extreme weather conditions experienced across parts of the UK have brought home the devastation and damage that can be wreaked by torrential rain and storm water. As the country becomes increasingly urbanised, and as pressure on housing forces new developments to be built in more marginal areas prone to flooding, the impact of this hard landscape on our watercourses is a significant cause for concern.

Drainage control and effective water management are important issues for our industry. Tarmac is working to develop products for Sustainable Urban Drainage Systems (SUDS), which are helping to reduce pressure on the existing drainage system and minimise the impact of flooding.

### Tarmac's solution

Tarmac's innovative porous pavement system has been developed after extensive research and development and has been extensively tested in-situ by the Transport Research Laboratory by evaluating sites that are more than 5 years old. The system complies with PPG25 and Part H of the Building Regulations, so can form part of any planned scheme or can be used as a stand-alone product for a range of applications such as car parks, playgrounds, sports surfaces, hard standings and pathways, or on any lightly trafficked area.

The system comprises an aggregate reservoir made from a specially graded sub-base material that is designed to create the maximum void space in which to store water. The sub-base can accommodate water more than 30% of its own volume, which can be held and then channelled into existing drainage system, or captured for use as grey water. The aggregate sub-base also provides a stable platform on which to construct the required porous asphalt layers. The system has a permeability designed to cope with up to 5,000mm of rain per hour.

As the rainwater drains through the porous reservoir, it is cleansed of impurities like oil and sand, so that it re-enters the drainage system as grey water and can be used without further treatment for applications that do not require potable drinking water. This helps to reduce the demand on primary drinking water supplies, providing an environmentally friendly and cost effective whole life alternative to traditional drainage systems. Because the technology is flexible, if designed into projects at an early stage, Porous Pavements can also be used to provide grey water supplies for domestic use, like toilet flushing and general garden watering.

### System performance

Dr. Howard Robinson, head of product development at Tarmac, explains: "Our patented Porous Pavement technology has been developed to help the industry overcome the challenges posed by increasing urbanisation in the UK and the subsequent lack of permeable areas for water drainage. Run-off from hard surfaces ends up in our drains and rivers, along with any pollutants along the way. Porous Pavement technology helps to manage the risk of flooding by easing flow rates through the traditional drainage systems and improving the quality of this run-off water in the process. Effectively, the system stores rainfall, allowing it to drain through the aggregate sub-base over a period of time, to either be dispersed into the environment at a controlled rate, or harvested for re-use as grey water." At Withywood, we have been able to provide the Centre with the ability to access the collected grey water supplies, which they are using at the moment for watering their landscaped areas and we know they are also investigating other uses for the water."

### Contact Details

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