Polypipe Civils & Green Urbanisation's roof level innovation offers ground-breaking climate and water resilience vision for Manchester and beyond

Retrofit Smart Blue-Green Roof

Polypipe Civils & Green Urbanisation's blue-green roof installation, combining Permavoid and Polysync, has transformed a city-centre tower block into a luscious, wildflower sky-meadow which has the potential to influence the future of urban design and the role it plays in managing the impacts of climate change.

Blue-green roofs

What is a blue-green roof? While green roofs include a conventional drainage layer to remove rainwater, blue roof technology increases the volume of water stored and control when and how much water is released into the local sewer network. A blue-green roof offers a combination of all benefits, with the added technology of passive irrigation to the vegetation layer above offering true resilience with space for water in flood events and stored water during drought events.

CASE STUDY

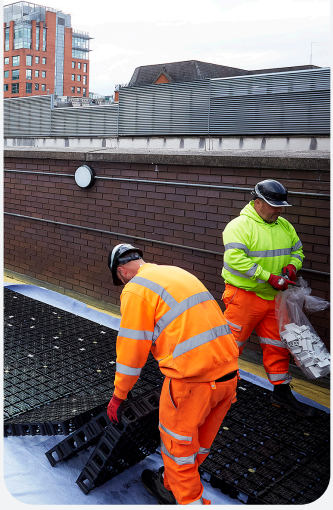
Street
Marble Street

Project
Bloc

Client
Bruntwood Works & United Utilities

Application
Blue-Green Roof

Products
Permavoid and Permafilter Geotextile



Permavoid

Permavoid is a shallow sub-base attenuation system comprised of high strength modular cells connected using PermaTies to create a structural 'raft'. Made from 100% recycled polymer, the system manages rainfall at source by retaining surface water for re-use or gradually releasing it into the drainage system to combat flooding in periods of extreme weather. Certified to BS 7533-13, the system can be used to attenuate water at roof, podium or ground level.

In Greater Manchester, as part of the £4m Ignition Project launched in 2019, city centre buildings – including high rise residential developments and offices – are being adapted to increase the use of nature-based solutions to play a role in mitigating the climate crisis, through the clever storage and reuse of stormwater.

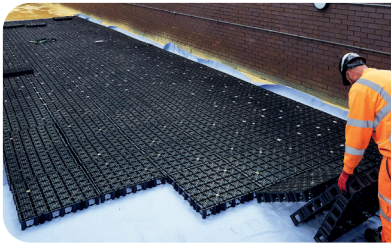
An originating sponsor of the Ignition Project initiative, Bruntwood Works partnered with experts in the field to install a smart blue-green roof from Polypipe Civils & Green Urbanisation on its newest Manchester city centre development, Bloc.

The North West often faces times of having too much or too little water, so infrastructure that can capture water's full efficiency and improve waste water capacity is truly valuable. A blue-green roof would achieve multiple objectives: mitigate flooding and the urban heat island effect, improve biodiversity in the city centre and set a sustainability standard for all future developments to aim towards.

"By introducing integrated natural habitats across the urban landscape, we create healthier, more resilient communities that are highly carbon and energy efficient."

"As a company we continue to explore innovative ways on how things can be done differently, as we look at alternative methods to increase resilience in our sewer systems, away from simply building underground. As such, we're heavily invested in learning more about urban assets that can deliver surface water separation and sustainable solutions which can make our regions more resilient to the long-term impact of climate change."

Sophie Tucker, United Utilities' Area Engineering Manager



In February 2021, installation of a blue-green roof began. Designed by environment management consultants The Environmental Protection Group, part of the STRI Group, the blue-green roof was created with Polypipe Civils & Green Urbanisation's unique Permavoid shallow sub-base water attenuation system. The net-zero carbon system manages rainfall at source – whether at roof, podium or ground level – by retaining surface water for re-use or gradually releasing it into the drainage system to prevent flooding in periods of extreme weather.

Unlike a conventional green roof, the blue-green structure stores rainwater beneath the planted surface within the Permavoid cells. Breakthrough passive irrigation 'wicking cones' within the attenuation layer draw water up through the structure to the underside of the green roof substrate where it is available to support surface planting. This helps to protect green areas during periods of drought, reduces potable water demand during hot weather and enhances biodiversity by maintaining flora in optimum growing conditions.

To further enhance the capabilities of the blue-green roof, Polysync, a game-changing intelligent surface water optimisation system that responds to forecast weather events was installed to the structure.

Polysync is a revolutionary solution using real-time high resolution weather forecasting data to optimise water volumes stored in attenuation tanks like Permavoid, to achieve flood and drought resilience. If heavy rainfall is forecast in Manchester, the Polysync system in place at Bloc will instruct the attenuation tank to reduce its stored water volume ahead of time to accommodate storm flow without surcharging the local sewer or river network. If a prolonged dry spell is predicted, the system will maintain maximum volume for re-use for the irrigation of the green assets above and in turn, support Biodiversity Net Gain requirements.

Over the next two years, Polysync's 'smart' capabilities in the blue-green roof will allow United Utilities – which co-funded the installation at Bloc – to assess how storing and re-using rainwater at roof level can reduce the volume of surface run-off entering its sewer network in Manchester and, as a result, lower the flood risk associated with prolonged high-intensity storm events.

The system has the potential to influence the future of urban design and the role it plays in managing the impacts of climate change. No longer just another bare roof space, it's now a luscious, wildflower sky-meadow that has injected colour, beauty and biodiversity into Manchester's skyline, showcasing the potential of all future developments.

"At Bloc, the latest project in our £50m Pioneer programme, we've transformed a traditional corporate office building into an innovative and futureproof workspace that's at the cutting-edge of design. With its potential to mitigate the impact of climate change while promoting health, wellbeing and biodiversity, Polypipe's blue-green roof is a perfect example of the future workspaces of tomorrow, today. The purpose of workspaces is evolving, and it just goes to show the integral role buildings such as Bloc will play in shaping communities and urban landscapes of the future."

Andrew Cooke, Strategic Director at Bruntwood Works,

With thanks to key partners for making this project possible:

Bruntwood Works
STRI
EPG
United Utilities
Kisters
Cubic Works
Solutek
Carrick

About Polypipe Civils & Green Urbanisation

Polypipe Civils & Green Urbanisation designs, develops and manufactures the UK's leading range of integrated water management, green asset and network systems solutions for every sector of the construction industry.

Enhancing resilient development, Polypipe partners within both customers and suppliers to minimise the environmental impact of its products, maximising the use of recycled materials and renewable energy wherever possible. The company currently re-processes over 16,000 tonnes of plastic waste each year in the manufacture of its products.

What is Green Urbanisation?

Green Urbanisation is an evolution of sustainable drainage (SuDS). It describes the integration of conventional green infrastructure and water management into a single extended network that optimises and supports multifunctional sustainable landscapes across cities, transport infrastructure and commercial developments. Scalable in application from a single plot to an entire river catchment, this breakthrough in holistic development helps mitigate the impact of climate change and population expansion.






For further information on Polypipe Civils & Green Urbanisation and its complete range of market-leading systems and services, visit www.polypipe.com or contact 01509 615100.

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