



Project Description

The 16,500m² new Faculty of Social Sciences building is designed to meet the future growth demands of the department up to the year 2035 and creates a world class, BREEAM outstanding building that encourages collaboration and enhances the Faculty's reputation for excellence in teaching and research.

The Challenge

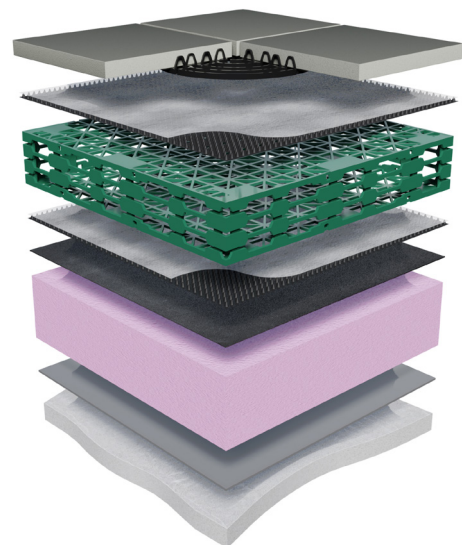
The landscape design for the new University of Sheffield building set out to create a large area of public realm on the social sciences campus, with provision for sustainable drainage systems including extensive use of tree pits and rain gardens. As part of the SuDS design specifications, a Blue Roof stormwater drainage system was considered as an alternative option to underground attenuation tanks to keep surface water run-off within the discharge consent.

The Solution

ABG were able to demonstrate that specifying a shallow Blue Roof attenuation layer involved much lower carbon emissions than excavating underground storage tanks. The volume of vehicle movements required to install underground stormwater attenuation compared to the **ABG bluroof** system was calculated (delivered from ABG's factory based 25 miles away), and a **carbon footprint saving of 59%** was estimated. The reduction in construction emissions was deemed particularly important given the site's proximity to the Royal Hallamshire Hospital. The 108mm **ABG bluroof** system design was fitted over a 4,500m² roof catchment area by the **ABG Installs** team over a period of 8 weeks. The inverted roof system build-up includes a 245mm XPS insulation installed onto the waterproofing with a Water Flow Reducing Layer (WFRL) above. The **ABG Deckdrain** 4mm geocomposite drainage layer is installed above

Project Information

Client	University of Sheffield
Contractor	BAM Construction ABG Installs
Architect	HLM Architects
Products	ABG bluroof 108mm system
Quantity	4,500m ²
Benefits	<ul style="list-style-type: none">• Carbon footprint saving compared to underground attenuation tanks• Management of stormwater run-off and local flood risk• Filters out pollutants



ABG bluroof 108mm paved system



a 100mm void former, wrapped in a Terrex NW20 geotextile layer to prevent debris entering the drainage voids. The roof build-up is completed with a surface finish combination of stone ballast and 63mm pavers. For the majority of the year, the roof drains into the rainwater outlets as normal, however during prolonged spells of heavy rainfall the void formers begin to temporarily attenuate the stormwater. During storm periods the rainfall outflow rate is slowed using 13 stainless steel restrictor chambers, positioned above each rainwater outlet. This controls the volume of water that is able to discharge from the roof during the storm, minimising surface water run-off and reducing the risk of flooding in the local area. The system is calculated to only reach maximum attenuation volume during a 1-in-100 year storm event, as calculated using the Flood Estimation Handbook rainfall data for Sheffield, plus 40% allowance for climatic change. The system features an integrated overflow outlet in the event a storm occurs that exceeds this designed capacity.

The ABG Service

In addition to design and install of the Blue Roof, ABG has commissioned a weather station on the roof to be able to capture and monitor real-time rainfall data.



Rainfall monitoring station

FoSS Site – Pollution Reduction

Transport distance saving: (vs underground storage)	10,000 miles
Total Nitrogen Oxides (NOx):	18,947 g
Total particulate matter (PM10):	284 g
Carbon Dioxide from transport: (CO ₂ e)	3.81 t
Reduction in the volume of drainage stone going to site	400 m³
Overall percentage reduction	59 %

Note: PM10 = Particulate matter less than 10 micrometer in diameter (<0.01mm).

Site traffic calculation assumptions:

- Number of vehicles and deliveries to site required reduced by 200, each travelling a 50 mile round trip.
- 2 excavators operating for 2 weeks, running 7 hours per day to complete the storage tank excavation



Stainless steel restrictor chamber