

**Smart roof**  
**AYLESFORD/ KENT**  
Polypipe Group

## **BIG Biodiversity Challenge Award Category: *Innovation Award***

### **Project overview**

Project involved creating a permavoid roof system with sedum top layer. Recognising that the health and survival of green roof can be dependent upon unpredictable weather patterns, with new techniques and technologies we are able to create a system which automatically monitors, and manages water supply to provide optimum conditions.

### **What were the biodiversity conditions on site, prior to the enhancement?**

Flat roof, no biodiversity prior to the enhancement.

### **What were the reasons behind this project ?**

There were several reasons why we did this project. Since this is one of the first systems of this type installed in UK there are no design guides for the UK for this area of the building industry and we wanted to be at the forefront of this. Therefore, we needed to set up instrumentation to gather data surrounding the effects of Blue Green Roofs. We have also added biodiversity value to the project as we care about environment we live in and want to provide space for wildlife.



*Polypipe Green Blue Roof*

### What were the biodiversity measures taken?

Project is easily replicable on flat roofs with clear biodiversity net gain to the area. It requires little interference and can be controlled/ checked remotely. Bees are looked after by our inhouse beekeeper who also happens to be HSE manager. Roof tends to be ideal environment for bees as it is replicating natural environment high in trees.

Additionally to green blue roof we have introduced educational scheme - POLYnator Site- where we encourage staff to increase bee population and make our site more sustainable. Presentation also includes slides about current situation of bees in the UK and how we can help them as well as explaining benefits of having bees around us. By increasing our bee population we will also increase our overall bio-diversity , bees pollinate and attract other insects and birds. As stewards of our surrounding environment I think it is important to celebrate the extra biodiversity that this small team may be able to bring.

Overall finding from invertebrates' study on the roof showed significant activity of pollinators around flowing plants (wet cell) comparing to rest of the roof area and there are clear preferential trends within vegetative zones on the roof. This could well be a preference for blue flowering plants however taking into considerations the other patterns that have been observed study would be inclined to suggest that this is simply a result of preference for well-watered flowering plants over the sedum mat. In conclusion, the storage of precipitation and capillary irrigation of the roof vegetation proved to be an effective measure for increasing total annual evaporation. Increased storage reduced average annual water shortage for Sedum dominated vegetation from 28% to 4% and for a grass/herbs vegetation from 29% to 12%



*Bee hive on top of roof*



### Further information

Project greatly improved environmental awareness of people working in the building and become a very good visual product display for our clients. We have a sitting area up on roof which is regularly used by our staff. Green blue roof increased biodiversity on site, improved rain water management and provide heat insulation. Additional benefits include honey that is collected now on a regular basis.

Currently no design or installation standards exist for blue green roofs and existing British standards regarding flat roofs design somewhat contradict the blue green roof applications green roof irrigation can be a stress on valuable portable water resources.

### What was the motivation for carrying out the enhancement?

We understand the water management challenges cities face, along with additional challenges of providing sustainable inner-city soft landscaping and wanted to demonstrate the viability of providing multifunctional benefits by introducing retrofit Green Infrastructure. When Polypipe’s office in Aylesford, Kent required roofing renovation, the decision to create a Blue-Green roof was an easy one and provided the opportunity for design and development of new, intelligent water management system while also providing a valuable amenity space for wildlife and staff.



Roof during construction



Smart roof