

The GlaxoSmithKline Carbon Neutral Laboratories for Sustainable Chemistry University of Nottingham, UK

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BIG Biodiversity Challenge Award category: Medium Scale Permanent

Project overview

The two-storey research and teaching facility, part-funded by GlaxoSmithKline and completed in June 2016, features a fully naturally-ventilated laboratory and innovative technologies to make it the first building of its kind in the UK and includes a sloping wildflower roof to enhance local biodiversity.

The combined heating & power (CHP) engine and 1,100m² of photovoltaic panels will enable the project to repay the embodied carbon of the building materials and construction process through carbon-negative operation over a 25 year study period.

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

The previously developed site comprised mainly of semi-improved grassland, featuring habitats of low value. No notable or rare habitats were present.

Were there any specific conditions that led to you carrying out this work?

The stretching sustainability goals which include BREEAM 'Outstanding' and LEED 'Platinum' targets focused the project team on how to enhance biodiversity within the design of the new facility.



Photo Description: webcam photo showing the main entrance and green roof of the building.

What were the biodiversity measures taken?

A North-facing extensive 1,000m² ecologically valuable green roof has been specifically designed and developed for the building location, orientation and roof steepness. An agreed 34-species extensive wildflower mix has been selected specifically for use on roofs, which predominantly exhibits high drought tolerance, is UK-native and does not contain invasive wildflowers, thus maintaining a species balance and optimising biodiversity. The form of the building is governed in part by the natural ventilation design, causing the top section of the green roof to be sloped at 20 degrees. Early engagement with our green roof specialist allowed us to develop a slope retention and drainage system that allows the roof to thrive, even on a 20 degree roof pitch.

The embodied carbon modelling of the building took account of the transport of all materials, including the green roof. For this reason, both the recycled substrate (made from composted green waste) and the seeded turf were sourced from within 150 miles of the site.

The building is constructed on a previous Raleigh development, and as such provides a significant biodiversity enhancement to the plot of land and local area. The wildflower roof surface spreads from the top of the building down to ground level, enabling access to a diverse spectrum of wildlife. A long-term maintenance strategy was agreed with Nottingham City Council planning department to ensure the biodiversity is sustained.

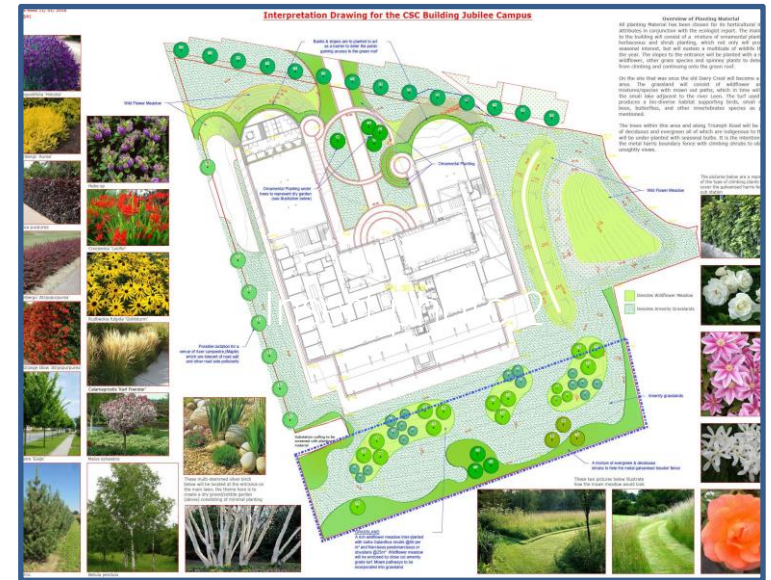


Photo Description: indicative landscaping plan.

What were the biodiversity measures taken? (Cont'd)

In addition to the green roof, six bird boxes of different designs have been installed for common species, and a landscaping scheme has been developed – the installation of which is on-going as of July 2016 – that further enhances the habitat value of the previous site condition (see picture above).

How would you best describe the project?

An enhancement.

Further information

There has been an immediate increase in biodiversity with the successful flowering of the wildflower roof. Future benefits are anticipated: the bird boxes have been positioned so that they are sheltered from the prevailing wind, with the majority positioned close to an adjacent pond, to connect the wildlife of this site and adjacent areas.

During our construction works, we were given the opportunity to demolish the redundant buildings and hard standing beyond our site boundary, allowing the landscaping plan to be extended by a further 2,000m². This additional landscaping and changes to the green roof seed mix (from 20 species to 34 carefully selected and appropriate species) during the design development stage have both exceeded expectations.



Photo Description: the completed wildflower roof.

What was your personal motivation for carrying out the enhancement?

Sustainability is at the core of our **company's** vision, and biodiversity is a fundamental part of this. The biodiversity that we implemented on this project for the University of Nottingham contributes to the realisation of this vision, that our work may better support the primacy of nature in urban areas.