



Nature in the City

Barbara Goncalves explains that green roofs are here to stay

With the pressure of urban development and a scarcity of land, adding new green spaces to our towns and cities requires inventive solutions, and we can draw inspiration from the ancient tradition of creating green roofs and walls.

Against this backdrop of changing environmental climates and financial uncertainty, one thing is certain – extra green space is a positive asset in any city. Taking a closer look at any modern metropolis today, and the lack of green spaces or integration of nature is evident. Since the Industrial Revolution, the conquest of space by the built environment in our cities is clearly visible. Propelled by the exodus of people from the country into the cities seeking work and better life conditions, a hard bitumen landscape has taken over our cities fulfilling our demands. But in the last few decades, attitudes have changed and people's views on their surroundings and what they want from them have changed too. It has been proven that green spaces create a sense of wellbeing, and have a positive effect on people's health: a feel good sensation perhaps. After so many years detached from Mother Nature, it seems that we are now getting back to our roots, and increasing concerns about the environment have boosted the demand for green space and better connections with nature.

AN HISTORICAL ROLE

You could be forgiven for thinking that the green roof is a fairly recent creation, but it is possible to trace the history of living walls and roofs back to the beginnings of recorded history. From the hanging gardens of Babylon to Bronze Age British roundhouses, from plant-draped Roman architecture to the traditional insulating turf roof found in Scandinavia, cultures around the world have long understood how soil and vegetation bring benefits to the built environment. The recent return of the green roof has been inspired partly by rediscovering traditional techniques and also by advances

in roofing technology which is helping to grow an entirely new industry.

BUILDING UP THE LAYERS

Modern green roofs comprise a sophisticated sandwich of components. Based on a waterproof layer, green roofs usually include a root barrier, drainage layers, silt barrier and growing medium and vegetation – often sedum. The cross-section shows their basic components. There are two main types of green roof – intensive and extensive. They are classified according to the amount and type of maintenance required and the depth of growing medium and the type of vegetation they support. Intensive green roofs include traditional roof gardens, where regular maintenance is required, the growing medium or soil tends to be deep, irrigation is normally necessary and they are usually accessible. Relatively expensive to install, their weight requires a substantial supporting structure.

Extensive green roofs offer a lightweight alternative. In wet climates they can be established on soils as shallow as 20mm and need minimal maintenance – just an annual check to remove tree seedlings and to unblock drains. The relatively low cost of installation means that this type of green roof has become the most popular in recent years. Its low weight makes it possible to retrofit to existing particularly commercial buildings.

Both types have advantages and disadvantages. For example, the depth of soil on an intensive roof allows for a wide variety of planting, which can be quite conventional and may even include trees, but running costs are high. On extensive roofs there is usually an opportunity to focus on providing wildlife habitat. An advantage of intensive green roofs is that they can also be used as amenity spaces. There is also currently much excitement around a new wave of living walls, which rely on irrigated soil-less (hydroponic) matting or modular substrate-based planters. These high-tech systems can be very



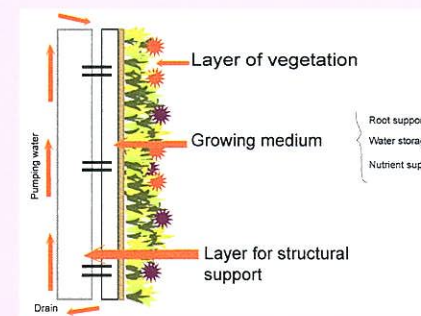
Opposite page Yarra's Edge, Melbourne, an attractive cityscape green roof made using a combination of native grasses, crushed recycled glass and pebbles

Above The Horniman Museum, London by ecologist Gary Grant

Right top A typical cross-section of an extensive green roof

Right bottom Typical living wall section

Far right Central Place Development, Beijing, where microclimates influenced the design and planting materials



expensive; however the unit cost is expected to fall as their popularity grows. If the budget is limited, the age-old method of growing climbing plants up a trellis still looks good.

WHY BUILD GREEN?

Faced with the growing demand for green spaces in our cities and the lack of room for traditional parks and gardens, urban designers may have found a way of providing more greenery in green roofs and walls. In addition to looking attractive, the green roof offers advantages over traditional materials with benefits in biodiversity, local environment, building running costs and more.

The economic benefits are that a green roof:

- insulates the building against hot and cold weather, reducing costs in heating and cooling
- extends the life expectancy of the roof membrane
- reduces the stress on drainage infrastructure and on-site water storage requirements
- may accelerate the process of gaining planning permission
- may add value to the property
- can score highly in environmental building rating schemes

The environmental benefits are:

- reduced run-off by retaining up to 90 per cent of rainfall
- filtering dust and pollution
- wildlife habitats
- dampened noise levels
- insulating the building and helping to reduce energy consumption as well as carbon emissions
- reducing the urban heat island effect (where buildings fabric warmed by the sun causes cities to heat up at night)



The social benefits are that it provides:

- a public amenity to local residents and visitors,
- an aesthetic green space or pleasant view
- environmental benefits that contribute towards improved quality of life.

POLICY AND PRACTICE

Despite the leading role played elsewhere in Europe by countries including Germany and Switzerland, the incorporation of green roofs and walls in the UK is still small scale. However 2008 will see a major step forward, with livingroofs.org, the London based UK green roof group hosting the World Green Roof Congress in association with CIRIA (www.worldgreenroofcongress.com), including a safari tour around London's green roofs. The focus is on the contribution of green roofs to sustainable urban regeneration, climate change adaptation, sustainable storm water management as well as improvements to local biodiversity and quality of life within cities. Of course the policy context is already in place with The London Plan including a green roof policy *Living roofs and walls – Technical report: supporting London Plan policy* (February 2007), in which aspects of this industry are clarified.

At EDAW, we have been encouraging clients to consider green wall and roofs for projects in China, Australia and across the US. Recent UK proposals include integrating a green wall in a major commercial scheme to generate public interest and promote the development, and green roof housing as part of the wider public realm strategy for Kings Waterfront masterplan in Liverpool.

While there is growing public awareness and curiosity about green roofs, there is still much more to be done to dispel popular myths and encourage central government and local authorities to provide more incentives. However it now looks as if green roofs are here to stay.

Barbara Goncalves, ecologist at EDAW