

## ENVIRONMENTAL AND COST BENEFITS OF GREEN ROOFS

This is a summary of the environmental and cost benefits which can be associated with Green Roofs. It is by no means a definitive list and figures quoted are from sources listed in 'Further Reading' below.

### ENVIRONMENTAL BENEFITS

#### 1. Energy Conservation

Green roofs provide greater thermal performance for the buildings on to which they are laid, although this will vary depending on the time of year and the amount of water they hold.

In Summer, the green roof reduces the amount of sun's energy absorbed by the roof, keeping the rooms below cooler, therefore allowing for cost savings in air conditioning.

In Winter, the extra insulation provided by the green roof can reduce heat loss, and this will depend on the green roof build-up and will vary according to how wet the roof is. It has been estimated that fuel savings could be as much as 2 litres fuel oil/M<sup>2</sup>/year.

#### 2. Noise

The typical build up of a green roof system can act as a sound insulation barrier. The level of noise reduction will vary with the type and depth of the green roof, but a typical build can reduce noise within a building by approximately 8Db.

#### 3. Rainwater Run-off

In Summer, green roofs can retain up to 70% of rainfall, particularly within the initial period following a rain storm. In Winter, this reduces to 25-40%, again this is dependant on the type and build-up of the green roof. Therefore, green roofs can be used as part of an urban drainage system to moderate storm water run-off.

#### 4. Air Quality

Large scale planting can help to reduce the problems of urban air quality. Green roofs can form part of large scale planting schemes and contribute towards the improvement of air quality. This happens because plants reduce carbon dioxide in the atmosphere and produce oxygen, absorb other gaseous pollutants and filter out air-borne particulates such as heavy metals.

Green roofs also help to improve the urban heat island effect, therefore playing a positive role in improving air quality.

#### 5. Bio-diversity & Wildlife

The very nature of green roofs mean they will be more beneficial to bio-diversity than standard roofs, but to benefit local bio-diversity they need to be more specifically designed.

### COST BENEFITS

#### 1. Fuel Savings

Because of their ability to cool buildings in summer and insulate them in winter, there are a number of studies showing the reduction in running costs for heating and air conditioning within rooms of buildings with green roofs. Some estimates have indicated savings of 2 litres fuel oil/M<sup>2</sup>/year!

#### 2. Drainage

The installation of a green roof could provide developers and builders with savings in the reduction in the number of rainwater down pipes, as the green roof will absorb and utilize large volumes of water therefore reducing the actual rainwater run off from the roof.

#### 3. Secondary Aggregate Re-use

Re-use of aggregate as part of the green roof, or the re-instatement of the ground from the building foot print as part of a bio-diverse roof, could save the developer a large amount of the cost of the roof, as well as reducing the cost of transporting muck away from the site.

### OTHER BENEFITS

- Attractive open spaces
- Protection of waterproofing membranes
- Health
- Use of recycled materials

### FURTHER READING/REFERENCES

[www.english-nature.org.uk](http://www.english-nature.org.uk) (see English Nature report no. 498 on the benefits of green roofs)

[www.livingroofs.org](http://www.livingroofs.org) an independent UK resource for information on green roofs

[www.igra-world.com](http://www.igra-world.com) the International Green Roof Association