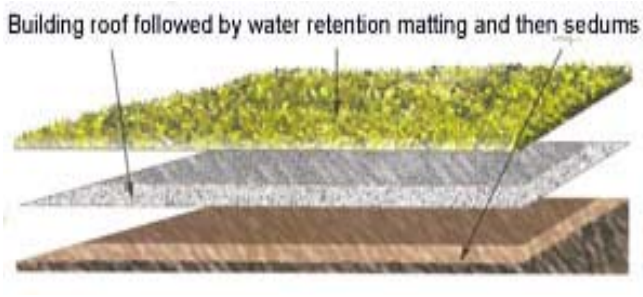
Cool Buildings with Sedum Roofs

There are a number of benefits to choosing a Living Roof, they absorb and fix CO_2 whilst releasing oxygen, reduce flooding risks and save on energy bills, whilst they protect the roof membrane from climatic extremes, UV light & mechanical damage and increase the life expectancy or the roof covering. A good quality root resisting waterproofing roof system with a normal life expectancy of 30 years, can be expected to last up to 60 years if covered with a living roof product.

There are 3 types of Living roof system currently on the market in the UK, *Substrate Based Roofs* that use crushed recycled brick placed on roof and plug planted with sedums, *Green/Brown Roofs* that are similar but use recycled aggregate and are left to colonise naturally or seeded with an annual wildflower mix and the third system, *Sedum Mats*.

A sedum mat is grown on a base layer of Polyester, Hessian, or porous polythene, on to this is laid the growing medium and sedum cuttings. These grow into the substrate to maturity and when harvested the sedum blanket is rolled up and delivered to site. Sedums are used because they are wind and frost resistant and have the ability to absorb water making them drought resistant too.

On site, the Sedum blanket including 2cm of growing medium is rolled out onto either a growing medium or direct moisture retention blanket.



Living roofs have a positive effect in terms of energy savings through their ability to cool buildings in summer reducing the need for air conditioning and improve thermal insulation during the winter.

In summer poorly protected and insulated roofs can lead to substantial overheating of spaces beneath them and a need for increased air-conditioning. However, a living roof not only acts as an insulation barrier but the combination of photosynthesis, transpiration and soil processes reduces the amount of solar energy absorbed by the roof membrane. The overall effect results in cooler temperatures beneath membranes. On a typical summer day with a mean daily temperature of 18.4°C, temperatures reduce from a typical 32°C for a normal roof to 17.1°C beneath the membrane of a living roof.

During the winter living roofs have been found to provide higher thermal barriers although this is dependent on the amount of water held within the system. Water retention can increase the amount of heat lost through the system and therefore any efficiency gains are dependent on daily conditions. It is therefore difficult to provide accurate figures on the net effect of living roofs on energy efficiency during the winter months. However, a study at Trent University on the temperatures under membranes showed that for a mean daily temperature of 0°C, beneath membrane temperatures for a normal roof were 0.2°C whilst the membrane of a living roof was 4.7°C.

Weight loading of a living roof can be as much as 125kg/m^2 hence existing structures need to be surveyed

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