



The benefits and challenges of green roofs for developers and designers

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Applying a green roof on a new or existing building can be a challenge. Developers and designers have to balance the sometimes competing goals of providing the greenest space possible and, at the same time, creating a rooftop area that can be used in a variety of ways by the people and businesses occupying the offices or residential units of the green-roofed building.

As the desire for green roofs becomes more widespread, the question becomes not just "Should I add a green roof?" to my building," but "How can I add a green roof to make it work most efficiently and effectively?" A skilled landscape contractor or architect must weigh all factors to determine the best possible green roof design for each building. For example, whether tenants will have access or the roof will be installed for environmental benefits will affect building codes. Structural capacity also needs to be considered: will the building be able to support the weight of a green roof?

First, it's important to keep in mind the many advantages of green roofs. Some of the major benefits are:

- * Maintenance reduction
- * Reduction and recycling of storm water runoff
- * Air quality improvement
- * Reduced heat island effect, particularly in large urban areas, due to cooling
- * Longer life span than standard roof systems due to better roof membrane and protection from UV radiation and temperature fluctuations
- * LEED accreditation in a competitive marketplace
- * Aesthetic and psychological restorative and healing effects

Often the planted portion of the green roof is both the simplest and most obviously beneficial aspect. The planted area is seen as a universal good. The soil acts as a sponge, catching rain water, reducing runoff into city sewers and holding it for the plants. The plants use the rain, absorb the energy of the sun and carbon dioxide, and produce oxygen. In short, all elements converge to form a beautiful and interesting surface where there would otherwise be nothing more than a hot black tar roof.

The difficulty comes in striking a balance between creating the greenest roof possible and providing access to the space. The dual goals are to have the roof fully used and enjoyed by tenants or residents and to make every inch green in the sense of eco-friendly. The landscape contractor or architect must calculate not just how many square feet of the roof should be planted and how many should be hard surface, but is it possible for hard surfaces to use eco-friendly materials and become an integral component of the overall greening.

For example, when recycled wood decking is used for the hard surfaced areas the decking needs to be placed in close contact with the soil with minimal space below for air circulation. This can lead to

moisture and mildew problems which, in the long run, make it unsustainable. Â

One option is to use a combination of concrete pavers and gravel paths. This forms a durable and sustainable hard surface. Then the question becomes: How can we integrate these materials with the plantings in a way that provides the greatest environmental benefit?

Any rain falling on paved or gravel covered areas is lost to the system and will never recycle back: it drains directly into the drainage mat, then down and out. In addition to keeping non-planted surfaces to a minimum, green roof designers had to change the way in which they function to minimize this drawback.

Placing pavers directly into the green roof medium and planting the small gaps between them with creeping thyme or scotch moss captures the runoff and brings green advantages directly to the paved areas. To help keep the load weight low, high density foam blocking is placed under the center of each paver which doesn't obstruct the water flow. The rain falling on the planted and hard surface spaces will be captured. It will pass through the soil, greatly reducing the runoff, and will benefit the adjacent plantings.

A well designed and carefully planned green roof is one that is truly beneficial to the environment and highly accessible to those who live and work in the building so they may enjoy it most fully.Â In this challenging real estate economy, it's a major plus in attracting and retaining tenants and residents to the property.

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