

LIVING ROOF SYSTEMS

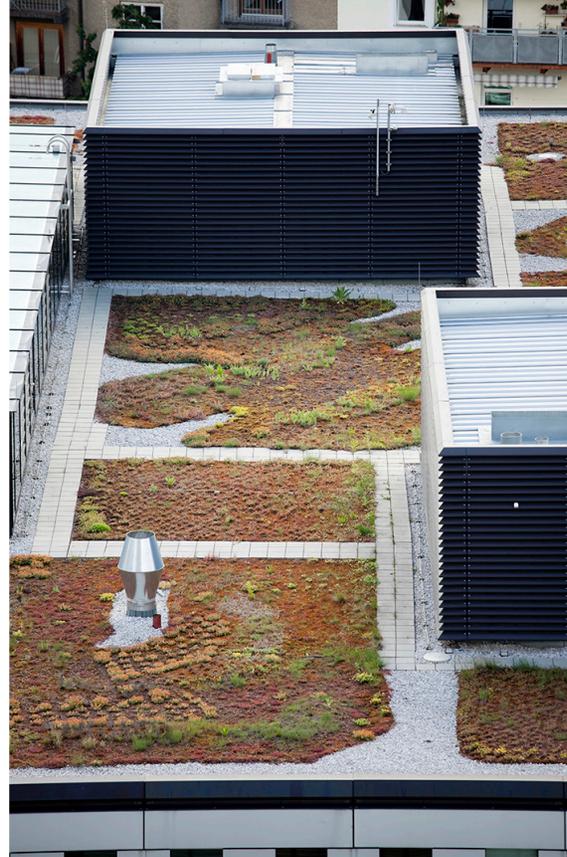
WHAT IS A LIVING ROOF?

A Green roof or living roof is a roof of a building that is covered by growth medium and living vegetation. All living roofs are constructed over a waterproof membrane, but additional layers may also be added to serve as a root barrier and to support drainage and irrigation systems. Today the term “living roof” is often associated with modern high rise buildings in densely inhabited urban zones, however, sod roof construction is a primitive form of living roof which traces back to rural Scandinavian building practices of the early middle-ages.

WHAT ARE THE FUNCTIONS AND BENEFITS OF LIVING ROOFS?

A living roof can significantly expand the habitable area of a building for occupant use, such as a park-like area, a vegetable or flower garden, a patio or view area. The vegetation layer keeps the roof area much cooler and protects the roof membrane from U.V. radiation and drying winds. As such, potential membrane life expectancy may increase by 200%–300%. Living roofs provide substantial insulation value resulting in reduced heating and cooling loads within the building interior.

For example, air conditioning expenses in single story buildings with a living roof could be reduced by 25–50%. Living roofs also reduce urban heat island effect, reduce fire risk, reduce ambient noise, create habitat for songbirds, butterflies and insects, and mitigate the impacts of storm water runoff from the site. For example, they retain up to 45% of the rainwater that would otherwise discharge into the storm drain system. The roof vegetation and substrate can filter heavy metals and pollutants from the rainwater.



WHAT ARE THE LESS TANGIBLE BENEFITS OF LIVING ROOFS TO BUILDING OCCUPANTS?

Living roofs are multi-functional groundcover which can contribute to a building’s aesthetic characteristics. Greenery is known to improve mood and the perception of well-being of building occupants and can counteract a sense of tension brought about by the constructed environment. Researchers have found that natural views can lead to greater concentration and reduced workplace absenteeism in the workplace.

WHAT ARE THE TYPES OF LIVING ROOFS?

Living roofs can be classified as intensive, semi-intensive, or extensive, depending on the depth of the planting medium. An extensive living roof supports 10–25 pounds of vegetation per square foot while an intensive living roof supports 80–150 pounds per square foot. Extensive living roofs require a minimum of maintenance, are usually only accessible to maintenance staff, and are virtually self-sustaining. Intensive living roofs are more like traditional roof gardens which require higher maintenance and support vegetation with deeper roots. These park-like settings are usually made accessible to building occupants.

WHAT ARE DISADVANTAGES OF LIVING ROOFS?

The main disadvantage of a living roof is that the initial cost can be double the cost of a conventional roof. An extensive living-roof system can cost \$108–\$248/m² while an intensive living roof cost \$355–\$2362/m².

The additional mass of substrate and water required for an intensive living roof would make it problematic for most existing buildings without structural reinforcement due to static loading requirements.

In some cases living roof systems have experienced water retention problems which can degrade the roof membrane or lead to root penetration through roof membranes. Another disadvantage is that pest insects may be attracted to the roof area upon which they can invade the building interior through open windows. Extensive living roofs without irrigation systems often lack biodiversity as only a few plant species can survive the harsh rooftop conditions in summer.



REFERENCES & RESOURCES

LiveRoof www.liveroof.com

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