

# GREEN ROOFS

Green roof technologies have been used successfully in Europe for decades but are just now catching on in the United States. The basic concept involves placing vegetation and soil over a waterproof membrane. There are two types of green roofs – intensive and extensive. Intensive green roofs have deeper soils and more plant variety. Extensive green roofs have more shallow soils and consist mainly of ground cover and grass.

## Benefits of Green Roofs

**Reduction of stormwater run-off and improvement in water quality.** One of the biggest benefits of green roofs is reducing stormwater runoff. In densely developed areas, land is at a premium and stormwater basins are not cost-effective. The storm sewers may already be at maximum volume during storm events, resulting in flooding and pollution. Green roofs hold rain like a sponge and allow the plant material to gradually absorb and filter rainwater rather than draining into basins or storm sewers, thereby reducing the need for stormwater infrastructure.

**Reduction of heating and cooling costs.** The surface of a conventional black roof can reach up to 180°F. Vegetation protects the roof from extreme temperatures and lowers the temperature of urban environments to remediate the radiant heat given off by the building, known as a “heat island” effect. Green roofs also reduce the energy requirements of a building. By reducing the ambient temperature of the roof’s surface, green roofs slow the transfer of heat into the building. This transfer reduces the cooling requirements of the facility. Green roofs also provide insulation to the structure and therefore reduce the heating requirements of the facility. Some studies have shown a 25% reduction in summer cooling needs, a 95% reduction in heat gain and a 26% reduction in heat loss compared to a traditional roof. The reduction in energy costs yields long-term cost savings.

**Increased longevity.** The plant material on top of the roof membrane reduces ultraviolet rays and extreme temperature fluctuations that can cause expansion and contraction. Because the roof membrane is protected, it is estimated a green roof can last twice as long as a conventional roof, resulting in substantial long-term cost savings.

**Sound insulation.** For areas adjacent to airports, high traffic or machinery, green roofs can absorb or deflect sound from 40 to 50 decibels. This aspect of green roofs would be most useful for facilities such as hospitals, libraries or other spaces where a quiet environment is desired.

**Improvement of aesthetics and habitat creation.** Green spaces are limited in cities. However, additional spaces can be carved out of previously underutilized areas, such as roofs. Many types of green spaces can be created whether they are outdoor patio spaces, safe havens for birds and insects or attractive spaces to be viewed from inside as a means to increase productivity.



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