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## PROTECTING THE ENVIRONMENT AND SAVING MONEY...

A green roof, or rooftop garden, is a vegetative layer grown on a rooftop. They can be installed on a wide range of buildings, from industrial facilities to private residences, and range in size and scale, from a 2-inch covering of hardy ground-cover to a fully accessible park complete with trees. While the initial costs of green roofs are usually higher than those of conventional materials, building owners can help offset the difference through reduced energy and stormwater management costs, and potentially by the longer lifespan of green roofs compared with conventional roofing materials.

It is the desired function of the roof space that usually drives the green roof design, resulting in designs requiring different soil depths and drainage systems to accommodate various plants, shrubs, and trees. Thus, the number of layers and the layer placement vary from system to system and greenroof type, but at the very least all greenroofs include a single to multi-ply waterproofing layer, drainage, growing media and the plants, covering the entire roof deck surface. Addition-

al structural support may also be necessary to accommodate more extensive green roofs with higher roof loads.

Researchers and communities are beginning to perform detailed, full life-cycle analyses to determine the net benefits of green roofs. A University of Michigan study compared the expected costs of conventional roofs with the cost of a 21,000-square-foot (1,950 m<sup>2</sup>) green roof and all its benefits, such as stormwater management and improved public health from the absorption of nitrogen oxides. The green roof would cost \$464,000 to install versus \$335,000 for a conventional roof in 2006 dollars. However, over its lifetime, the green roof would save approximately \$200,000. Nearly two-thirds of these savings would come from reduced energy needs for the building with the green roof (Clarke, 2008).

### GREEN ROOF BENEFITS

- Reduce building temperatures;
- Filter pollution;
- Aesthetic value;
- Reduce pressure on sewer systems;
- Reduce “heat island effect;”
- Reduction of dust;
- Addition of sound insulation to building;
- Creation of habitat for wildlife;
- Addition of temperature insulation to building.



*Oasis Associate, Inc. designed a green roof for a San Luis Obispo hotel using low maintenance plant materials.*

## GREEN ROOFS CONT...

### FOR MORE INFORMATION:

Clark, C., Adriaens, P., and Talbot, F. (2008). Green roof valuation: a probabilistic economic analysis of environmental benefits. *Environmental Science and Technology* 42(6):2155–2161. Retrieved 17 June 2010 from <http://www.portlandonline.com/bes/index.cfm?a=261053&c=50818>

EPA (2010). Reducing Urban Heat Islands: Compendium of Strategies – Green Roofs. Retrieved 17 June 2010 from <http://www.epa.gov/hiri/resources/pdf/GreenRoofsCompendium.pdf>.

Peck, S. and Kuhn, M. (2003). Design Guidelines for Green Roofs. Canada Mortgage and Housing Corporation and the Ontario Association of Architects. Retrieved 17 June 2010 from <http://www.cmhc.ca/en/inpr/bude/himu/coedar/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=70146>.



## OASIS ASSOCIATES

LANDSCAPE ARCHITECTURE + PLANNING

OASIS ASSOCIATES, INC. is a landscape architecture and strategic land planning organization based in San Luis Obispo, serving the Central Coast, southern and northern California. For the past three decades, we have provided our clients with a full service firm with a diverse and complimentary background of experience.

A focus on our client's objectives and the synergy between our land use planning and landscape architecture disciplines has resulted in the success of our endeavors. Our commitment to thoroughly analyze a project and our ability to solve complex problems require innovative and thoughtful planning and design skills. With this expertise, we continually strive to create the best possible project.

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