

## Spotlight on Green Communities

Whether they're purchasing renewable energy, recycling construction debris, or installing permeable paving, communities in northeastern Illinois are getting greener. On this page we're highlighting communities and park, conservation, and forest preserve districts willing to share their experiences with selected green practices.

### **Case Study: Village of Oak Park** **Green Roof**

Two to three times a month scouts, students, professional associations, and neighboring communities come out to see Oak Park's LEED (Leadership in Energy and Environmental Design) certified public works building. The highlight of the tours is the building's green roof, the topic of this Spotlight.



*A green roof after 3 years*

Karen Rozmus, Waste Reduction Manager and LEED AP, said that after their public works facility was destroyed in a fire in 2004, the Village directed staff to pursue LEED certification for a new building to replace it. The United States Green Building Council (USGBC), the creator of the program, defines LEED as "an internationally recognized green building certification system providing third-party verification that a building or community was designed and built using strategies aimed at improving performance in all the metrics that matter most: in energy savings,

water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts." (<http://www.usgbc.org>)

In simple terms, the USBGC will award a building green status (LEED Platinum, Gold, or Silver) if enough of the qualifying green building and development practices (there are also prerequisites) are used in design, construction, operations and planned maintenance; practices such as using local and recycled materials, low emissions paint and carpet, and installing solar panels. While the list of prerequisites and practices is too long to include here, more detailed information on LEED for New Construction and Major Renovations can be found at:

<http://www.usgbc.org/ShowFile.aspx?DocumentID=5546>. This Spotlight focuses on just one of the qualifying green practices: installing a green roof.

## Definition

Green roofs, also called eco-roofs or vegetated roof covers, can be installed on top of conventional flat or sloping roofs. Green Roofs for Healthy Cities, an industry association, describes a green roof system as “an extension of the existing roof which involves a high quality waterproofing and root repellent system, a drainage system, filter cloth, and a lightweight growing medium and plants.” Green roof systems can be modular with drainage layers, filter cloth, growing media and plants already prepared in movable, interlocking grids, or each layer may be installed separately on the roof. (<http://greenroofs.org>)

## Benefits

Many benefits are associated with green roofs. The *Whole Building Design Guide* (<http://www.wbdg.org/resources/greenroofs.php>), produced by the National Institute of Building Sciences, lists the potential advantages, which include:

- Control of rainwater runoff
- Improved water quality
- Mitigation of urban heat-island effects<sup>1</sup>
- Extended roof life
- Conservation of energy
- Reduced sound reflection and transmission
- Creation of wildlife habitat, and
- Aesthetic appeal



Oak Park's green roof

Green roofs cost more than traditional roofs and have a longer payback period, but the long term benefits such as lowering maintenance costs, saving energy, and extending the life of the roofing materials make it worthwhile in the long run. As Rozmus points out, it is easy to expand the green roof later on.

## The Process

The Village started off by establishing a “green team” consisting of architects, construction contractors and public works staff. The green roof was planned early in the building’s design phase. Because of the initial costs, the Village decided how much they could afford to install,

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<sup>1</sup> According to the United States Environmental Protection Agency, the term “heat island” describes built up areas that are hotter than nearby areas. The agency states that “In the evening, the difference can be as high as 22°F. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality” (<http://www.epa.gov/hiri/about/index.htm>).

which came in under 100% coverage of the roof (a green roof on its own gets LEED credit only if it covers 100% of the roof). The rest of the roof is white to reflect the sunlight, which earned credit towards the building's LEED certification.

The Village used a modular product GreenGrid Green Roof Systems (see: <http://www.greengridroofs.com>) rather than building the green roof in place. The modules came pre-planted with five different species of sedum. Sedum requires little or no maintenance and is well-suited to the climate and conditions in this region. The installation took one week. According to Rozmus, in the three years since Oak Park installed the roof, it needed weeding just once; no other maintenance was required. Oak Park's green roof also includes a solar thermal system and a patio made of recycled materials.

The *Whole Building Design Guide* lists considerations to take into account when planning a green roof, including:



*Installation of Oak Park's green roof modules*

- Strength of the supporting structure
- Size, slope, height, and directional orientation of the roof
- Type of underlying waterproofing
- Drainage elements
- Intended use (including who will have access and who will do maintenance)
- Visibility, compatibility with architecture, and owner's aesthetic preferences
- Fit with other "green" systems, such as solar panels, and
- Cost of materials and labor

## Costs

Green Roofs for Healthy Cities, an industry association, notes that the cost of installing a green roof varies depending on factors such as the depth of the growing medium, plants selected, size, use of irrigation, and whether it will be accessible or inaccessible (intensive, semi-extensive, or extensive<sup>2</sup>). It also notes that intensive green roofs typically require greater investment, while an extensive green roof with root repellent/waterproof membranes may be installed for \$10-\$24 per square foot.. (<http://greenroofs.org/index.php/about-green-roofs/green-roof-faq>).

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<sup>2</sup> See [http://www.greenroof.com/greenroofsys\\_extensive\\_roofs.shtml](http://www.greenroof.com/greenroofsys_extensive_roofs.shtml) for discussion on the difference between extensive and intensive green roofs.

Rozmus said Oak Park's green roof cost approximately \$10 per square foot. The entire public works facility was \$26 million; the additional "green" aspects, such as the heat recovery unit, the white and green roof, and some of the recycled content materials cost about \$1 million. Ultimately the facility earned LEED Gold certification, a higher designation than was originally thought possible given the nature and use of a public works facility.

## **Next Steps**

Currently the Village is working with a University of Illinois LEAP Fellow (Landscape, Ecological, and Anthropogenic Processes) to develop a monitoring plan to quantify results of the green roof installation. Rozmus says they plan to continue giving tours and hosting meetings, and will be hosting an open house once every other year.

## **Resources**

The following agencies and organizations can offer information, resources and/or potential funding opportunities for green roofs.

*Center for Neighborhood Technology:* <http://www.cnt.org/energy>.

*Green Roofs for Healthy Cities:* <http://greenroofs.org>.

*Illinois Clean Energy Community Foundation:* <http://www.illinoiscleanenergy.org>. Click here for [brochure with grant information](#).

*Illinois Department of Commerce and Economic Opportunity:* <http://www.commerce.state.il.us>. click here for [Green Roof Program](#) (application period currently closed)

*United States Environmental Protection Agency:* [www.epa.gov](http://www.epa.gov); [green roof link](#)

*United States Green Building Council:* <http://www.usgbc.org>

*United States Green Building Council-Chicago Chapter:* <http://www.usgbc-chicago.org>

*Whole Building Design Guide of the National Institute of Building Science:*  
<http://www.wbdg.org/resources/greenroofs.php>

For more information on the Village of Oak Park's Public Works Facility, contact Karen Rozmus, 201 South Blvd. Oak Park, IL 60302, 708.358.5707, [Rozmus@oak-park.us](mailto:Rozmus@oak-park.us).

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*Are there other green practice case studies you'd like to see? Is your community interested in being in the spotlight? Please contact Lori Heringa by phone at 312-386-8621, or by email at [lheringa@cmap.illinois.gov](mailto:lheringa@cmap.illinois.gov).*