Green Infrastructure Fact Sheet

Green Roofs

ILLUSTRATION: Jeffery Mathison

A green roof is a roof partially or completely covered with living plants and soil or other growing medium. Green roofs help reduce temperatures on the roof surface and the surrounding air during hot summer months, and can absorb and filter rain water, thus reducing the amount of stormwater runoff.

For more information:

Green Infrastructure Primer

www.de.gov/greeninfrastructure

Delaware Division of ENERGY & CLIMATE

Delaware Department of Natural Resources and Environmental Control

Benefits:

- Reduce energy needed to cool and heat buildings by absorbing heat and acting as insulation
- Capture and manage stormwater, reducing the volume of runoff and improving water quality by filtering and binding pollutants
- Improve air quality by removing air pollutants
- Provide habitat for pollinating insects and birds

DOVER LIBRARY GREEN ROOF The green roof was installed on the Dover Public Library building in 2012. It is planted with native plants that thrive without the use of irrigation. The rainwater from the building's roof is collected through the Green Roof and is used as Grey Water in the Family Restroom which is located under the Green Roof in the Children's Department.

PHOTO CREDIT: Dover Library and the City of Dover

Site and Design Considerations:

- New or existing buildings must be engineered properly to support the extra weight of the green roof, which varies depending on design:
    - Extensive green roofs generally weigh between 12 and 50 pounds per square foot, compared to 10-12 pounds per square foot for a conventional roof.
    - Intensive green roofs are considerably heavier, weighing 80-150 pounds per square foot.
    - Robust engineering design and materials are essential to prevent leaks into the structure.
- The slope of the roof is a factor for both design and function:
    - If the roof is inclined too much, the plants will not be able to absorb the water effectively.
    - Flat or gently sloping roofs are most accommodating, but roofs with as much as 40 percent slope can support vegetation with appropriate design and engineering.
- Plant selection must include perennial species that are heat-tolerant and drought-resistant due to the constant exposure to the heat, cold, and wind. For extensive green roofs, succulents generally perform well due to their drought tolerance, ability to take up large amounts of water, and low maintenance requirements.
- Green roofs can be designed in combination with conventional roofs. Even buildings that cannot accommodate an entire green roof may still able to fit a small one on a portion of the roof. This "hybrid" approach is important when designers are trying to reduce a building's total area of impermeable surface. Although the roof will not be entirely green, it will still be able to reduce energy uses and control a fair amount of stormwater.

Maintenance:

- Plants require regular irrigation and weed control until they are established (about two years).
- Extensive green roofs are designed to be self-sustaining, once established, with annual maintenance checks and minimal fertilizer applications.
- Intensive green roofs require regular landscape maintenance, including weeding, pruning, and watering. The level of care will depend on the design and species selection.
- Vegetation should be monitored to remove and replace dead or diseased plants.
- Invasive species should be controlled.

Resources:

University of Delaware – Cooperative Extension: Fact sheet on Green Roofs
http://ag.udel.edu/udbg/sl/hydrology/Green_Roofs.pdf

US EPA – green roof info
http://www.epa.gov/heatisland/mitigation/greenroofs.htm

Green Roofs for Healthy Cities: Green Roofs policy brochure
http://greenroofs.org/index.php/about/green-wall-benefits/2-uncategorised/328-policy-brochure-2014