

Green Roof

Overview

- A green roof is a roof planted with vegetation. During storm and precipitation events, green roofs reduce the amount of stormwater that runs off the roof and into a nearby water body.
- Green roofs can remove up to 50% of the annual rainfall volume that falls on the roof.
- Green roofs remove precipitation through water retention and evapotranspiration.
- There are two types of green roofs:
 - Extensive – low-growing plants with a thinner soil layer. Extensive green roofs are frequently used for residential structures as they are lighter and require less maintenance.
 - Intensive – low to medium growing herbaceous and woody plantings with a thick soil layer. Intensive green roofs require more engineering as they are heavier. They can be used to create a public space on a rooftop.
- Some green roofs require more maintenance than others.

Additional Benefits:

- Reduction of heating and cooling energy costs
- Improved air quality
- Attract wildlife including pollinators
- Reduction in noise pollution
- Aesthetically pleasing
- Reduction of long-term costs of a roof and extension of the life of the roof as green roofs shield ultraviolet light and heat
- Rainfall that is not absorbed by the green roof is temporarily detained, which can help to slow peak runoff flows in the watershed



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Key Takeaways

During storm events, water may flow off rooftops and then pool in yards or flood structures.

Flooding can cause extensive damage to the interior and exterior of structures (e.g. foundation damage). Additionally, pools of water can harm landscaping and provide breeding grounds for pests such as mosquitos.

To help avoid flood damage costs and decrease stormwater runoff, install a green roof on the structure's rooftop.



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I-ADAPT

Exterior Adaptation

Green Roof

Estimated Costs/Benefits

*U.S. dollars (2022), estimates are subject to change

Potential Costs		Potential Benefits	
Item	Estimate	Post-Flood Recovery Actions	Estimate
Green roof materials, preparation, and installation	\$8-\$50 per sq ft	Flood damage recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water ↓ 1 foot water \$10,800-\$53,500+ ↓ \$29,400-\$143,500+
		Remove standing water	\$1,300-\$13,500
		Mosquito control	\$400-\$600 per treatment
ESTIMATED TOTAL COST (500 sq ft roof)	\$4,000-\$25,000	ESTIMATED TOTAL SAVINGS	\$12,500-\$157,600+

Expected Maintenance

- Regular irrigation and weed control for the first two years.
- Add low amounts of fertilizer and re-plant annually, if necessary.
- Normal landscaping maintenance including weeding, pruning, and watering.

Additional Actions

- Ensure that gutters are functioning properly.
- Ensure that the lawn is graded for stormwater to flow away from the structure.

Potential Funding Sources

- [Delaware Water Pollution Control Revolving Fund](#)
- [Building Resilient Infrastructure and Communities \(BRIC\)](#)

Additional Resources

- [DNREC Green Roofs](#)
- [EPA: Green Roofs for Stormwater Runoff Control](#)
- [University of Delaware: Green Roofs](#)

Resources can also be found at <https://de.gov/iadapt>

Permitting Agencies

Contacts for permitting requirements include but are not limited to the following:

- Your city and/or county government for local flood ordinances or regulations
- Your city and/or county government for building permits

Who to Contact

- Green roof contractor
- Design engineer

Technical definitions and more information are located on the I-ADAPT website: <https://de.gov/iadapt>.



This information is intended to be used for planning purposes. It is not intended to substitute or take precedence over the guidance of design engineers, contractors, utility companies or regulatory agencies.

For more information, contact DNREC's Division of Climate, Coastal and Energy at DNREC_IADAPT@Delaware.gov

