

# GREEN ROOFS

## Green Infrastructure For Stormwater Management



### WHAT IS A GREEN ROOF?

A green roof is a stormwater management practice that incorporates vegetation and a soil media to reduce runoff. Unlike a traditional roof, green roofs promote retention and evapotranspiration of precipitation. Green roofs can be used in place of a traditional roof as a way to minimize runoff from the rooftop and manage stormwater runoff.

### WHY INSTALL GREEN ROOFS?

Green Roofs are primarily installed to reduce the volume of stormwater runoff and to protect water quality. The plants and growing medium of a green roof absorb water that would otherwise become runoff, filter pollutants, and prevent the transport of pollutants typically conveyed in stormwater runoff. Green roofs provide other benefits – they absorb sound to help reduce noise and filter out air pollutants commonly found in city centers. They protect the waterproofing roof membrane from ultraviolet rays and extreme temperature swings that provides a longer life expectancy for the roof.

Green roofs reduce the urban heat island effect by mitigating the heat fluctuations that are typically associated with dark-colored roofing systems. This can significantly reduce energy demands for cooling if HVAC systems are located on a green roof. Providing access to rooftop gardens provides residents green space to enjoy, which is a highly valued amenity in an urban setting. Finally, green roofs provide habitat for birds, pollinators and other insects.

## WHERE ARE GREEN ROOFS INSTALLED?

Green roofs can be installed on a wide range of buildings that have adequate structural integrity to support the weight of vegetation, the growing media, and the water that is temporarily stored in the roof system. They can be installed on new construction or can be retrofitted to existing buildings if they have the structural integrity.



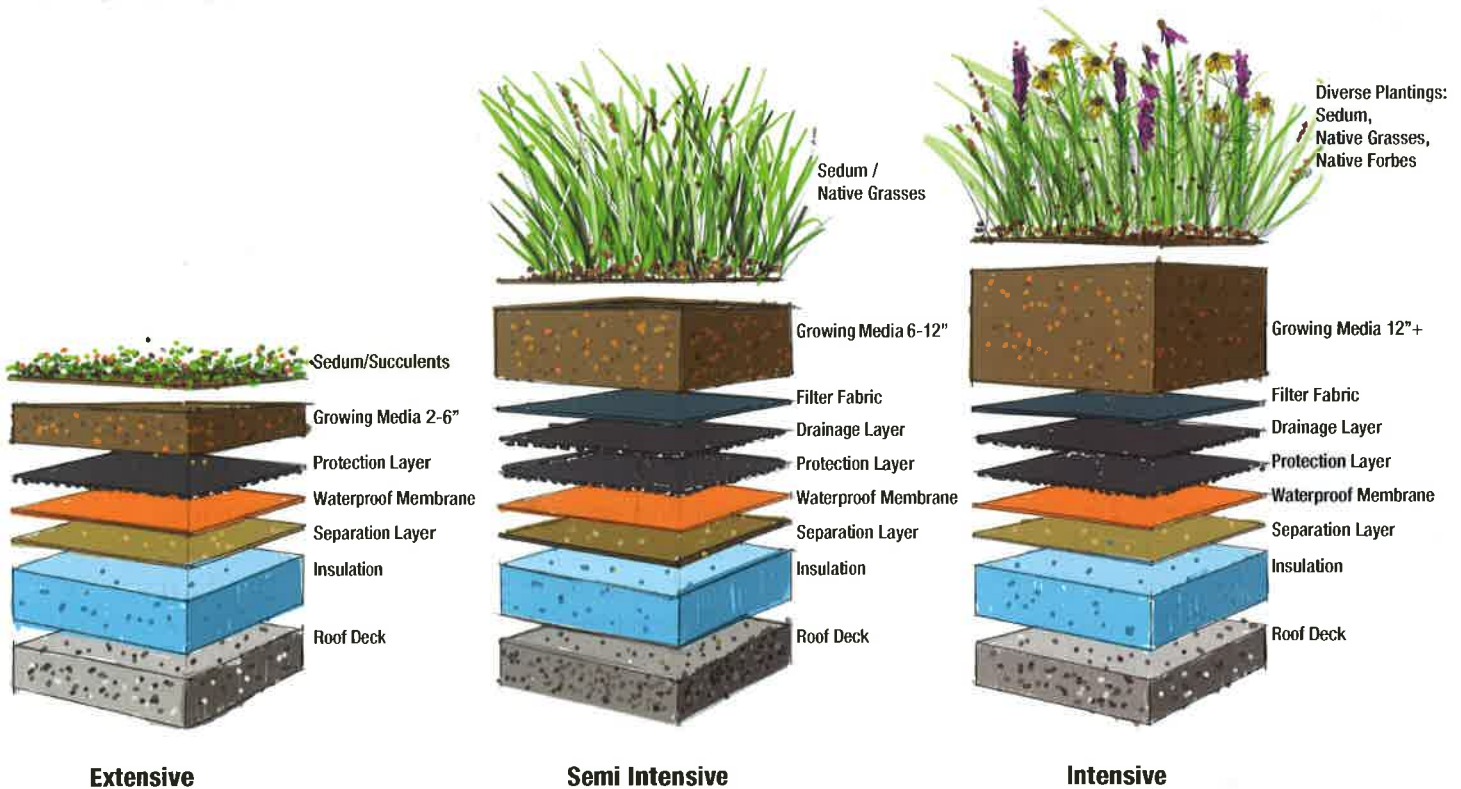
## GREEN ROOF COMPONENTS

There are three main types of green roof systems: extensive, semi intensive or intensive. They are primarily defined by the depth of growing medium.

1. **Extensive Green Roof:** 2-6" of growing medium; limited plant diversity (primarily sedum species); works well for building retrofits or new construction; may require irrigation for roofs that contain less than 4" of growing medium.
2. **Semi Intensive Green Roof:** 6-12" of growing medium; great diversity in plant selection; work well for new construction or major renovations.
3. **Intensive Green Roof:** 12" or more of growing medium; nearly infinite diversity in plant selection; well suited for new construction.



*Cross section of an extensive green roof tray.*



## GREEN ROOF INSTALLATION

There are two primary delivery and installation methods: in-situ and modular systems. In-situ or “built” up systems are constructed through a series of layers that are built-up on the roof deck using materials that arrive on-site in bulk. After placement of the components and soil media, the roof is vegetated by planting plugs, cuttings, or pre-grown mats. Modular systems or “trays” are mass produced in a nursery and individually placed on a rooftop in small 2'x4' plastic units filled with growing media. Pre-grown plants are then set on top of the waterproofing membrane and root barrier.



Sedum are custom grown in trays in an Iowa nursery.



Sedum tray system is installed in Des Moines.



Semi intensive green roof at Central College in Pella supports more plant diversity.



Quad Cities semi intensive rooftop has soil depths ranging from 4-8 inches.

## GREEN ROOF MAINTENANCE

- » Develop a maintenance plan.
- » Regularly monitor the roof top system.
- » Consider rainwater harvesting to meet irrigation needs.
- » Water the roof top vegetation regularly during the first two years and during periods of drought.
- » Weed undesirable species.
- » Replace dead plants, if needed.

# GREEN ROOFS OF IOWA



**1** Cedar Falls - University of Northern Iowa Apartments

**4** Des Moines - Downtown Public Library

**2** Ames - CyRide Bus Shelter

**5** Coralville - North Ride Pavilion

**3** Cedar Rapids - Water Tower Place

**6** Cedar Rapids - Public Library

