

## FACT SHEET

# Vegetative “Green” Roof



## DESCRIPTION

A vegetated “green” roof cover is installed on top of an otherwise conventional flat or pitched roof (< 30 degree slope) giving the roof characteristics that more closely resemble a natural environment.

The overall thickness of the veneer typically ranges from 2 to 6 inches and may contain multiple layers, consisting of waterproofing, synthetic insulation, non soil engineered growth media, fabrics, and synthetic components. Vegetated roofs, also called “green rooftops” can be optimized to achieve water quantity and water quality benefits.

These extensive vegetated roofs are limited to drought tolerant succulents such as sedum, can be sustained in a shallow substrate layer (<4 inches), require minimal maintenance once established, and are generally not designed for access by the public. These vegetated roofs are typically intended to achieve a specific environmental benefit, such as rainfall runoff mitigation. Extensive roofs are well suited to rooftops with little load bearing capacity and sites which are not meant to be used as roof gardens.



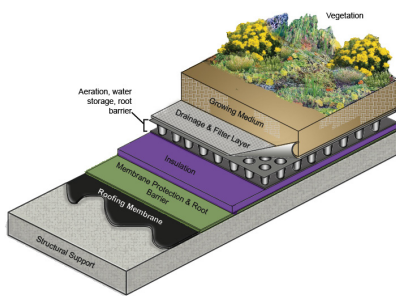
Tellus 360 newly installed green roof

## Potential Limitations

- Higher maintenance needs until vegetation is established
- Need for adequate roof structure; can be challenging on retrofit application



Residential vegetative roof in Lancaster, PA



Cross section of a vegetative roof

## BENEFITS

- Reduces stormwater run-off, filters toxins and pollutants
- Energy benefits (heating/cooling)
- Urban heat island reduction
- Extends life of roof
- High aesthetic value

## Potential Applications

Residential	Limited
Commercial	Yes
Ultra Urban	Yes
Industrial	Yes
Retrofit	Yes
Highway / Road	No / No
Recreational	Yes
Public / Private	Yes / Yes

Stormwater Quality Functions		Stormwater Quality Functions		Additional Considerations	
Volume	Medium / High	Total Suspended Solids	Medium	Capital Cost	High
Groundwater Recharge	Low	-	Medium	Maintenance	Medium
Peak Rate	Medium	Total Nitrogen	Medium	Winter Performance	Medium
Erosion Reduction	Low / Medium	Temperature	Medium	Fast Track Potential	Low
Flood Protection	Low / Medium			Aesthetics	High

## KEY DESIGN FEATURES

- Engineered media should have a high mineral content. Engineered media for extensive vegetated roof covers is typically 85% to 97% nonorganic.
- 2-6 inches of non-soil engineered media; assemblies that are 4 inches and deeper may include more than one type of engineered media. Vegetated roof covers intended to achieve water quality benefits should not be fertilized.
- Irrigation is generally not required (or even desirable) for optimal stormwater management using vegetated covers.
- Internal building drainage, including provision to cover and protect deck drains or scuppers, must anticipate the need to manage large rainfall events without inundating the cover.
- Assemblies planned for roofs with pitches steeper than 2:12 (9.5 degrees) must incorporate supplemental measures to insure stability against siding.
- The roof structure must be evaluated for compatibility with the maximum predicted dead and live loads. Typical dead loads for wet extensive vegetated covers range from 16 to 26 pounds per square foot.
- The waterproofing must be resistant to biological and root attack. In many instances a supplemental roof-fast layer is installed to protect the primary waterproofing.



Vegetative Roof at F&M College

## MAINTENANCE

- Once vegetation is established, little to no maintenance is needed for the extensive system
- Maintenance cost is similar to traditional landscaping, \$0.25 - \$1.25 per square foot

## COST

- \$10 - \$50 per square foot, including all structural components, water proofing, soil, and plants; generally less expensive to install on new roof versus retrofit on existing roof.



For more information about the Green Infrastructure program please contact:

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