J-DRain® GRS

Green Roof Drainage System

Before

Our Greenroof System (GRS) is designed as a reliable drain product to assist in the development of solidly performing greenroofs.

After

JDR Enterprises, Inc.

www.j-drain.com 1-800-843-7569

Greenroofs…
it's about 'attitude' & 'altitude'

Greening of new and existing buildings is a promising option for the urban setting.

Advantages Of Greenroofs:

- **Reduces rainwater run-off**
- **Reduces heat island effect**
- **Reduction of structure's heating & cooling costs**
- **Reduces sound levels**
- **Protects roofing from UV degradation**
- **Absorbs carbon dioxide**
- **Produces oxygen**
- **Additional use of space**
- **Provides wildlife habitat**

What is a ‘Greenroof’?

A **greenroof** is a ‘contained’ space on top of a man-made structure.

‘**Greenroof’** is often used to describe many other landscape & architectural treatments:

•Rooftop Garden

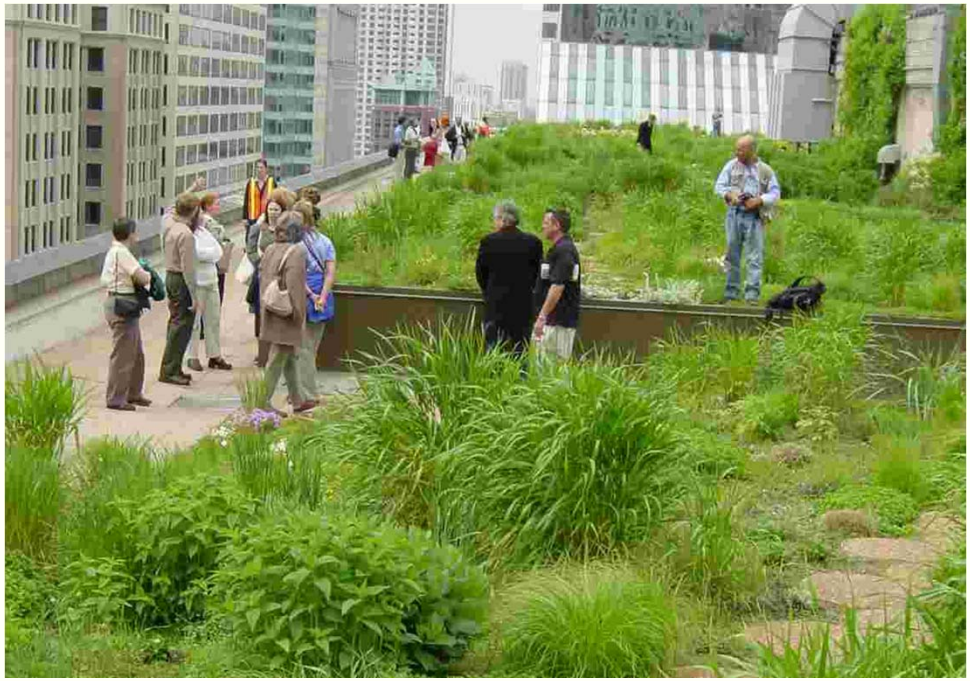
•Living Roof

•Turf Roof

•Sod Roof

•Eco-Roof

•Garden Roof



With current technological know how, greenroofs can be located on a variety of structures: atop underground parking garages, office buildings, hotels, residences, bridges, schools and even building edges.

Generally, there are two different kinds of greenroofs:

Extensive & *Intensive*

Low-Profile, Ecoroofs

- Low growth media: 2 – 6”
- Lightweight: 13 – 50 lbs/sf
- Low growing plants: 1”– 24” H
- Less variety of plants: Alpine types, succulents, herbs, some grasses and mosses
- Usually non-accessible
- Slopes up to 30° & higher
- Less expensive: $12-$25/sf
- Low water requirements
- Low maintenance

High-Profile; Roof Gardens

- > 6”-15’ and deeper
- Heavier weights: 50 lbs/sf +
- Trees, shrubs and more
- Huge variety of plant selection, depending on loads, design & budget
- Designed for human recreation
- Relatively flat
- More expensive: $25-$40/sf +
- Irrigation usually necessary
- Higher maintenance

Typical Greenroof Design

The basic components of a greenroof should include four essential layers:

- Waterproofing Layer
- Drain Layer
- Soil Layer
- Plant Layer

Each roof is unique! The success of a greenroof depends on the thorough understanding of all components and also the specific needs & conditions of the particular site. **Before any components are added to a roof, the structural weight limits must be determined by a professional.**

Waterproofing Layer

Correct and meticulous application of the waterproofing membrane is essential to the viability of the greenroof. The waterproofing system may consist of **a liquid-applied membrane, a specially designed single-ply, or multiple layers.**

The ultimate priority is to keep the building watertight.

Waterproofing Layer

A thorough **water flood test** needs to be conducted for leaks after the installation of the waterproofing membrane to ensure quality control, certainly before the other layers are applied.

To prevent root damage to the waterproofing membrane, some manufacturers incorporate a **root-repellant agent** in a roof membrane's formulation and others offer a physical root barrier.

Drain Layer

Greenroofs must have a ***drain layer*** to prevent water from accumulating on the roof or in the substrate. Good roofing practices require no water ponding.

Greenroofs are no exception.

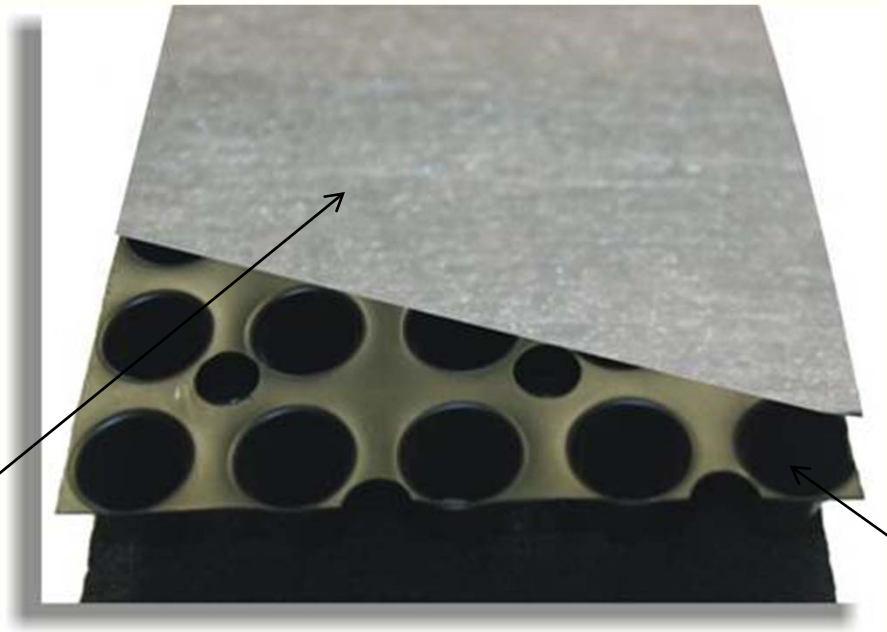
A drainage expert should be consulted regarding the physical characteristics of the drainage & filter fabric layers to assure they provide adequate water flow for peak rainstorms.

Drain Layer

The ***drain layer*** serves the dual purpose of keeping the soil well aerated & in some cases also acts as a water retention layer.

Unimpeded drainage is assured in greenroof systems because the ***drain layer*** is applied over the entire roof area.

Drain Layer



Root Resistant Filter Fabric The top fabric prevents fine particles from being washed out of the substrate soil and prevents majority of roots from growing and rotting in this stored area.

Water Retention Cups serve as a reservoir for irrigating plants between rainfalls.

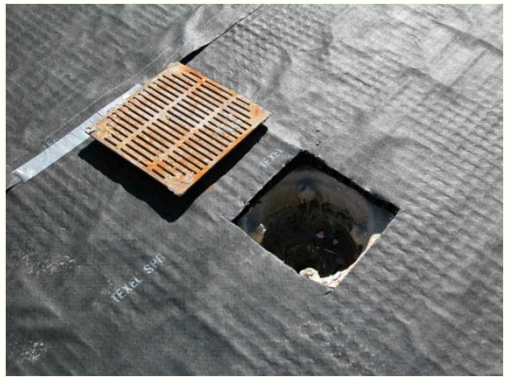
New ECO Fabric

Our green vision is now even greener

- 100 % Post consumer recycle polyester
- Better root resistance/UV
- Competitive edge to other greenroof systems
- Every square yard fabric contains one 2-liter-bottle
- LEED points by increasing overall recycle content

Drain Layer

Additional **Root Resistance Filter Fabric** is applied up sides of parapet wall & around all pavers and drain boxes, eliminating any chance of soil loss.



It is essential to mark the position of roof outlets before installing the **drain mat**, so that they can be located easily and cut out for easy access.

Excess fabric is then cut away after soil is installed.

Together, the **drain mat** forms an extremely stable and pressure resistant sub-base, ensuring efficiency of the drain layer and maximum, long-term success of the greenroof.

Because natural soils are heavy, particularly when wet, greenroofs often involve the use of ***lightweight engineered soil mixes***.

Soil cannot contain any silt that would clog or bind the filter fabric.

These soil mixes need to be:

- Water permeable
- Water & air retentive
- Resistant to rot, heat, frost & shrinkage
- Good nutrient status
- Provide an excellent rooting medium

Soil Layer

Plant Layer

Vegetation (green) is the most visible layer of the greenroof. Plants add aesthetics and ultimately determine the success or failure of the greenroof.
Compatibility of plant selection with the artificial environment is essential.
An experienced horticulturist should be involved in plant selection.

Characteristics of plants typically used on greenroofs include:

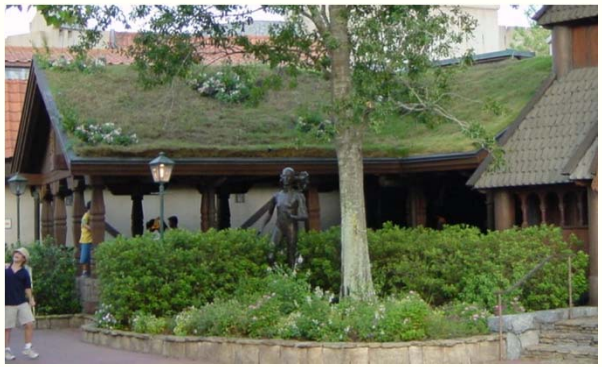
- Shallow root system
- Good regenerative qualities
- Resistance to direct sun, drought tolerant, frost & wind
- Compatibility with local range of temperature, humidity, rainfall & sun

Market Applications

In the United States the concept of greenroofs is just now being introduced and will become more common. They represent an ***entirely new market*** and business opportunity.

Commercial

Parking Decks



Residential/Multi-Family

Municipal/Government

Industrial

Educational

The potential market includes all existing and future roofs in the country.

A market too large to ignore.

JDR is Committed to Promoting Greenroofs

- Greenroof Research
- Greenroof Conferences & Tradeshows
- greenroofs.com & greenroofs.org
- Non-Profits
- Educate Architects, Contractors, Roofers
- Provide Technical Support & Resources

We Can Assist You!