



# Urbanscape Green Roof System

DESIGN GUIDE

**knauf**INSULATION

  
**urbanscape**

*Above and beyond*



# *Introducing...*



An innovative, lightweight green roof system with super high water retention capacity, designed specifically for green roofs on residential, non-residential and industrial buildings in urban areas.

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# Key benefits:



## Lightness

8 x lighter

A core component of the Urbanscape Green Roof System, Urbanscape Green Roll is 8-10 times lighter compared to traditional soil substrates used in green roofs. This means it can be used on almost any building structure without compromising its structural stability.



## High water absorption

10 x better

Urbanscape Green Roll allows for up to 10x better water absorption and retention than traditional green roofs, ensuring the roof performs better in rain water runoff calculations.



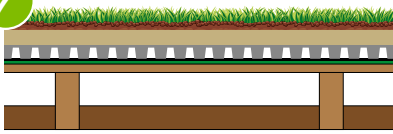
## Efficient installation

20 x less material

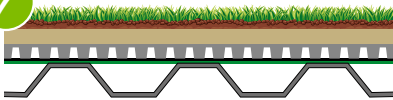
For a typical 1000m<sup>2</sup> green roof 2-5 tonnes of Urbanscape Green Roll is needed compared to 100 tonnes of traditional green roof substrates. Less material means significantly less labour is needed and installation is faster when compared to a traditional green roof installation.



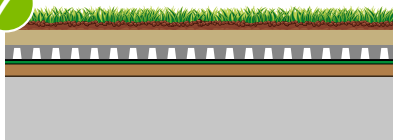
Timber deck



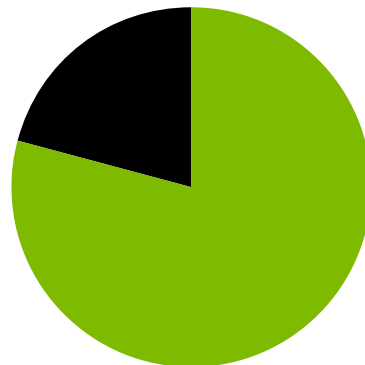
Steel deck



Concrete deck

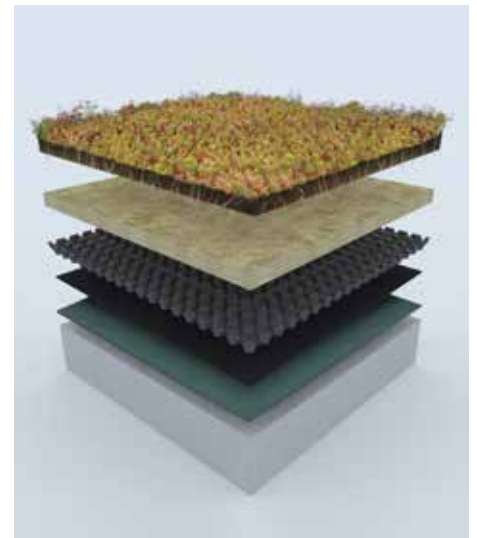


## Stormwater retention



To drains

Retained on roof



## Other benefits:



### Sustainable solution

Urbanscape Green Roll is made from various rock mixtures which are readily available from sustainable sources. The lightweight open structure promotes extensive root distribution and plant growth.



### High fire resistance

Urbanscape Green Roll is a non-combustible growing medium and will not contribute to the development or spread of a fire at any stage.



### High water distribution

Urbanscape Green Roof System acts as an irrigation system and provides the perfect water distribution between vegetation layer and the Urbanscape Green Roll. It has the advantage of saving water in relation to using sprinklers to irrigate on top of the vegetation.



### High acoustic performance

Urbanscape Green Roof System reduces noise pollution through surface absorption and reduces noise levels that affect safety and the health and well-being of the urban population.



### Complete solution

Urbanscape Green Roof System comes in complete, easy to install layers delivered directly to the customer. Urbanscape Green Roll does not require any special equipment to be installed or maintained.



# Why Green Roofs?

The design of buildings has evolved but their function has remained constant:

- protection
- comfort
- warm in winter
- cool in summer

The environmental impact of buildings and green roof solutions are becoming increasingly important.

With the sustainability of buildings having greater levels of importance, it is critical to remember that from a building lifecycle perspective the environmental impact of any building derives from the energy consumption during its lifetime, the use of renewable energy and the use of sustainable materials.

Green roofs go beyond simple contemporary architecture and give a new value to the role of buildings within urban planning. They are designed not only to bring nature back into the urban environment but also to provide solutions for important issues such as storm water management.



# Types of Green Roofs

There are two main types of green roofs



## Extensive green roofs

Extensive green roofs have shallow (typically 7-10cm) soil layers. They support sedums, moss, herbs and grasses and other vegetation where low or no maintenance is required. They are the lightest type of green roof. Extensive green roofs provide attractive protection to the waterproof membrane and significantly reduce water run-off. When the green roof is completed, inspection once or twice per year is usually sufficient. Regular fertilisation (typically once per year in winter or early spring) is required to ensure proper growth and success.

Irrigation systems are not typically needed, unless there are extremely long periods of dry weather. Regular access to extensive green roofs is not normally required.



## Intensive green roofs

Intensive green roofs have a deeper soil layer (15cm upwards) and a wider variety of plant types can be grown, from lawns to ornamental bushes and semi-mature trees. The type of planting will determine the depth of soil required, the need for an irrigation system and the level of maintenance. Regular roof access is normally provided on this type of green roof. As a result, paved areas, walls and even water features are often incorporated in the design.



Variables	Extensive	Intensive
Vegetation	Sedum, grass, herbs	Grass, ornamental bushes, trees
Height	<15cm	25 - 100cm
Irrigation	Mostly not	Always necessary
Weight	50 - 150kg/m <sup>2</sup>	250 - 1,000 kg/m <sup>2</sup>
Walking possibility	No/Limited	Yes
Water buffer	4 - 12mm	18 - 39mm
Load capacity roof	Most normally sufficient	Requires extra strong roof structure
Maintenance	Very low	Comparable with a normal garden
Roof pitch	Up to 45°	Flat or in terraces



# Green Roof Benefits



## Extended roof life

Green roofs have been shown to **triple the life expectancy of the roof**. The underlying roof materials are protected from mechanical damage, ultraviolet radiation and extreme temperatures, which results in reduced maintenance and renovation costs.



## CO<sub>2</sub> reduction

Green roofs help to reduce the amount of CO<sub>2</sub> in the air, which is considered one of the most important causes of global warming. **1m<sup>2</sup> of a green roof can absorb 5 kg of CO<sub>2</sub> yearly**. Additionally, due to reduced energy consumption there is a further impact on carbon dioxide reduction by 3.2kg yearly.\* As a perspective, 1m<sup>2</sup> of green roof can absorb the same quantity of CO<sub>2</sub> each year as a regular car would emit during a 80km drive.



## Rainwater retention

A major advantage of green roofs is the reduction of storm water run-off, which leads to **a decrease of the burden on sewer systems by 70-95% in summer**. Green roofs have influence on cost reduction due to low or no need for rain-catching cisterns and similar equipment which is usually used for storm water management. Rainwater retention capability helps to limit incidents caused by heavy rainfalls.



## Cleaner air

The plants on green roofs can also capture airborne particles such as smog, heavy metals and volatile organic compounds from the local atmosphere which has a positive effect on air quality and health of inhabitants. **Researchers estimate that 1m<sup>2</sup> of a green roof can help to absorb 0.2kg of airborne particles from the air every year\*\*.**



## Rainwater purification

Through natural bio-filtration, green roofs prevent contaminants and toxins from reaching streams and waterways. According to Kohler & Schmidt research (1990) **95% of the lead, copper and cadmium sulphide and 19% of the zinc coming from the rainwater remain in the substrate, which helps to improve local water quality.**



### Noise reduction

A green roof system provides good sound insulation, **keeps the living space quieter** and creates more pleasant surroundings in urban areas. It contributes to noise reduction in large cities, near industrial areas and airports.



### Usable green space

Green roofs help to provide additional green space in urban areas with limited open space and **add value to buildings**. Accessible roofs can be designed as community gardens, commercial or recreational space allowing numerous use opportunities.



### Natural look

The natural character of green roofs **provides relief from the concrete construction in urban areas** and introduces substantial changes to modern architecture. According to several studies the presence of green areas has a relaxing psychological effect, helps to reduce blood pressure and lowers the heartbeat. Due to multiple benefits, green roofs substantially enhance residential and commercial property values.



### Urban agriculture

Green roofs can additionally **create opportunities for urban agriculture**. They can reduce a community's urban footprint thanks to local food system creation and ensure self-reliance on food resources.



### Natural habitat

As urbanisation increases, ensuring biodiversity is one of the key requirements for local councils. **Green roofs can provide a habitat for various species and restore the ecological cycle** disrupted by urban infrastructure.

#### Benefit Icons Key



Economic



Environmental



Social

\*National Research Council of Canada

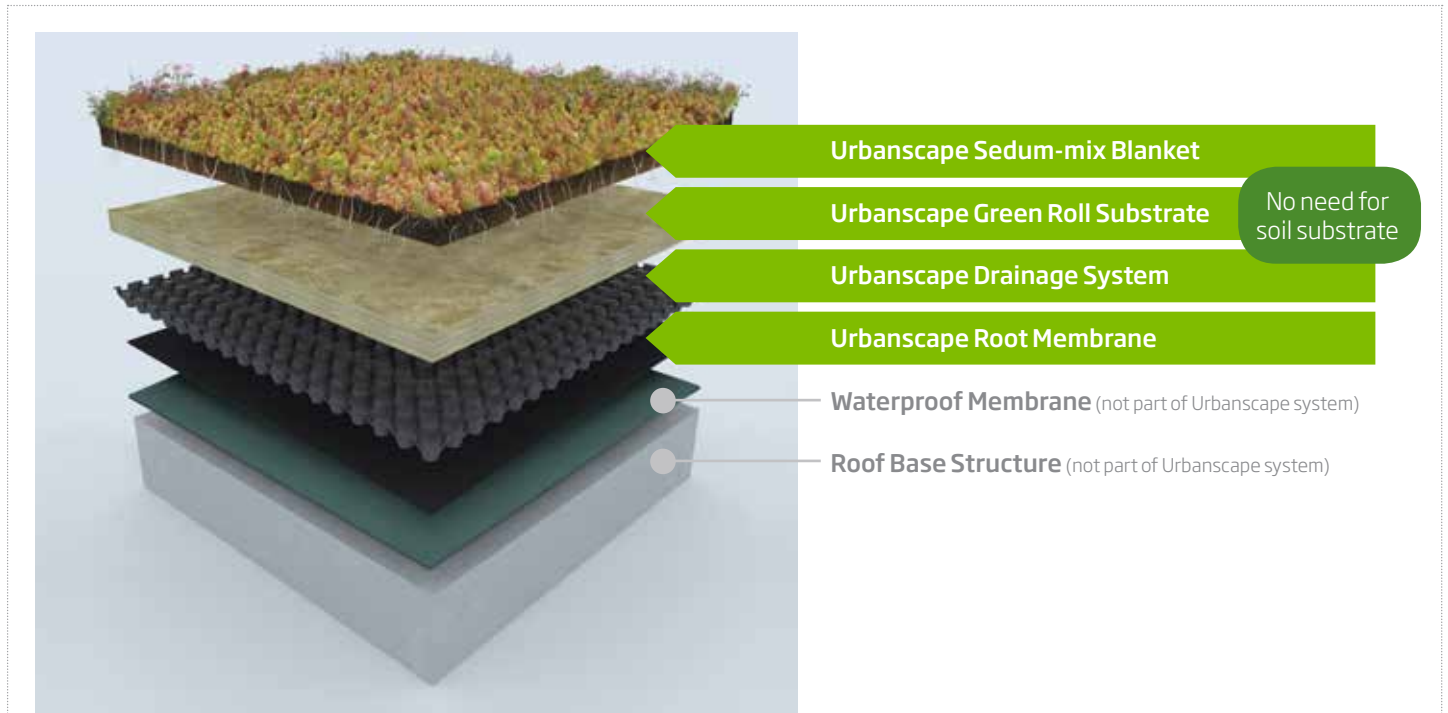
\*\*United States Environmental Protection Agency EPA -  
Reducing UHI: Compendium of Strategies



# Urbanscape Green Roof System

Urbanscape is an innovative, lightweight and easy to install system with high water retention capacity designed specifically for green roofs on residential, non-residential and industrial buildings in urban areas.

Urbanscape Green Roof is a complete system, which consists of a Root Membrane, Drainage System with buffer, Green Roll Substrate (made of Knauf Insulation's unique, patented and specially needled virgin Rock Mineral Wool) - and a Sedum-mix vegetation layer.

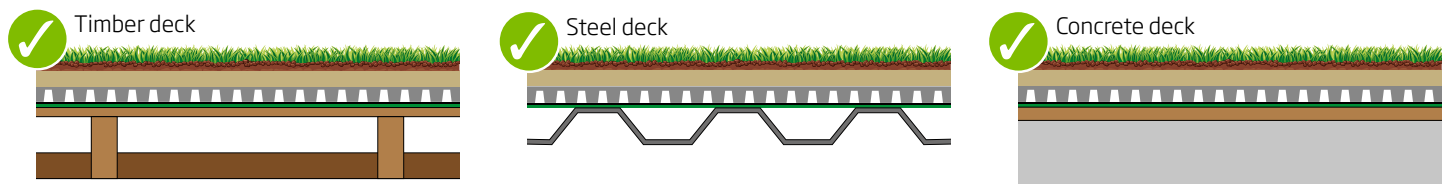


## Types of roofs

Urbanscape Green Roof System can be installed on any type of roof construction: on timber, steel, or concrete deck, inverted roof construction or any other type of material used on roofs. The green roof elements are the same in all cases, only the demands on the insulation and the position of waterproof membrane change.

### Applications

Urbanscape is light enough to be installed in all these applications.





# Urbanscape – Complete Solution



## Urbanscape Sedum-mix Blanket

The biodegradable **Urbanscape Sedum-mix Blankets** comprise of eight to twelve different species of Sedum. The blankets boast at least 95% coverage upon delivery. Urbanscape vegetation blankets are produced in accordance with FLL guidelines. The sebaceous Sedum plants are adept at storing water in their leaves and are therefore extremely suitable for varying weather conditions.

Thickness	20-40 mm
Standard size	1 x 1.2 m
Max roll length	20-25 m
Weight dry	15 kg/m <sup>2</sup>
Weight saturated	23 kg/m <sup>2</sup>



Urbanscape Sedum-mix Blanket

## Urbanscape Green Roll Substrate

Urbanscape Green Roll Substrate is a super lightweight green roof substrate made solely of virgin Rock Mineral Wool fibres specially needled to form a compact and dimensionally stable felt. Urbanscape Green Roll ensures excellent water retention and conservation in green roofs and is a good growing medium removing the need for traditional soil substrates. Urbanscape Green Roll Substrate is manufactured at a width of 1m, and with a thickness of either 20mm or 40mm.

Thickness	<b>20mm</b>	Thickness	<b>40mm</b>
Water retention	17 l/m <sup>2</sup>	Water retention	291 l/m <sup>2</sup>
Weight	2.20 kg/m <sup>2</sup>	Weight	4.40 kg/m <sup>2</sup>



Urbanscape Green Roll (HTC GR)

## Urbanscape Drainage System with buffer /Drainmat Roll

The **Urbanscape Drainage System with buffer** is a double sided drainage and reservoir board made from high-impact recycled polystyrene with excellent load bearing capacity specifically designed for green roofs and is lighter and more compact when compared to regular drainage layers. The **Urbanscape Drainmat Roll** is a three dimensional, light and flexible composite matting made up of a draining core, providing a high drainage capacity covered on both sides with a non woven filter fabric.

	<b>Drainage System with buffer</b>	<b>Drainmat Roll</b>
Height	25mm	20mm
Width	1.1m	1m
Length	2.02m	35m
Water flow capacity	0.77 (10KPa; i=0.01)	0.12 (10KPa; i=0.01)
Rain water retention capacity	11.8 l/m <sup>2</sup> m <sup>2</sup>	-
Compressive strength	444 kN/m <sup>2</sup> m <sup>2</sup>	-



Urbanscape Drainage System with buffer /Drainmat Roll

## Urbanscape Root Membrane

**Urbanscape Root Membrane** is made from black LD Polyethylene regenerate foil which is used to prevent the roots from penetrating the green roofs.

Average thickness	0.5 (+/-10%) mm
Width	4 (+/-2%) m
Length	25 (+/-3%) m
Size	2500 m <sup>2</sup> /pallet
Weight	0.5 kg/m <sup>2</sup>



Urbanscape Root Membrane

# Installation guidelines for flat roofs

## Equipment



- Scissors
- Hook cutter
- Drain basket
- Broom
- Suitable Personal Protective Equipment (PPE).

## Installation & Maintenance Tips



### Before installation

- For new build and renovation: check if the roof construction is strong enough to bear the extra weight of the green roof in wet conditions.
- For renovation: check if the existing waterproofing is in good condition. If the condition is poor, consider applying a new layer of waterproofing, compatible with the existing one. Always choose waterproofing with a root-resistance label.
- For new build: choose waterproofing with a root-resistance label.
- Check the local green roof regulations, paying special attention to local requirements for vegetation-free zone along edges, around airco-units, outlets, pipes etc.
- Ensure compliance with safety requirements for roof installation.

### Materials storage

- Store all materials out of direct sunlight.
- Make sure that the weight of the materials does not exceed the load bearing capacity of the roof and building construction.

### Installation

- Start installation within 24 hours from the day of delivery as the vegetation blankets should not be kept more than a few days (including transport time) in rolls.
- Install the green roof in above freezing temperature and in low wind speed conditions.

### Maintenance

- Fertilize the vegetation with supplementary nutrients 1 or 2 times a year.
- An irrigation system should be provided when the local climatic conditions dictate.
- Contact Urbanscape for a maintenance contract to ensure optimum performance of your green roof.

## Step 1 : Roof preparation



Clean the roof with a broom. Check that the waterproof membrane is not damaged to ensure the water tightness of the roof.

## Step 2 : Urbanscape Root Membrane



- If the waterproof membrane is not resistant to root penetration, it should be covered with a new layer or Urbanscape Root Membrane.
- The root membrane should cover the waterproof membrane with at least 0.5 meter overlap on all sides. Lay the membrane flat to avoid wind uplift.
- Cut out the root membrane where drain baskets must be installed. Do not cut directly on the waterproof membrane. For safety reasons and protection of the root membrane use a hook cutter. Do not use a sharp blade cutter or knife.

## Step 3 : Urbanscape Drainage System



- Cover the total roof area with the drainage panels.
- Cut out the drainage panels where drain baskets must be installed. For safety reasons and protection of the drainage panels use a hook cutter. Do not use a sharp blade cutter or knife.



## Step 4 : Urbanscape Green Roll Substrate



- Roll out the Urbanscape Green Roll Substrate crosswise on top of the Urbanscape drainage panels. Install tightly side by side.
- Leave an area of 20cm clear from the edge of the roof, which will be used as a gravel area. (see Step 7).
- If necessary Urbanscape Green Roll can be cut to the right size (using a pair of scissors or sharp blade).

## Step 5 : Urbanscape Sedum-mix Blanket



- Gently roll out the Urbanscape Sedum-mix Blanket crosswise over the Urbanscape Green Rolls Substrate.
- Start with the flap at the top. Check the position of the Urbanscape Sedum-mix Blanket before rolling out.
- If necessary, the Urbanscape Sedum-mix Blanket can be cut to the right size using scissors or a hook cutter.
- The Urbanscape Sedum-mix Blanket must cover the total area of Urbanscape Green Roll Substrate. If a gravel border is being installed, ensure a 20cm gap is left between the Sedum-mix Blanket and the perimeter of the roof.

## Step 6 : Urbanscape Drain Basket



- Place the Urbanscape Drain Basket on drain pipes.
- Install the Urbanscape Aluminium Edge Profile around the perimeter of the Sedum-mix Blanket, hooking the lip under the Urbanscape drainage panels.

## Step 7 : Gravel area



- Fill up the space between edge of the roof and Urbanscape Sedum-mix Blanket with gravel between 16-32mm.
- Make sure that Urbanscape root barrier is totally covered.
- The height of gravel should be at the same level as the Urbanscape Sedum-mix Blanket.

## Step 8 : Post installation



- Cut off the visible root membrane from the roof edge. Do not cut directly on the waterproof membrane. Do not use a sharp blade cutter or knife.
- Fill bare spots with pieces of vegetation.
- Water the vegetation until Urbanscape Green Roll Substrate is saturated.





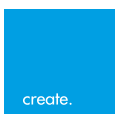
## With 40 years of experience in the insulation industry, we are leading the change in smarter insulation solutions for a better world.

### Our mission

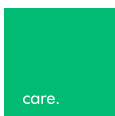
"Our mission is to **challenge** conventional thinking and **create** innovative insulation solutions that shape the way we live and build in the future, with **care** for the people who make them, the people who use them and the world we all depend on."



We challenge ourselves, regulators and our industry to develop new concepts and new ways of thinking about insulation and buildings;



We create innovative solutions that change the way we work and set new standards of quality, performance and sustainability;



We care about what really matters: our people, our customers, our communities and ultimately, our planet.

### Our vision

"Our vision is to lead the change in smarter insulation solutions for a better world. Our aspiration is to be the world's most trusted insulation partner providing high performing and smart insulation solutions and services for a better world."

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