PLANNING GUIDE

System Solutions for Thriving Green Roofs

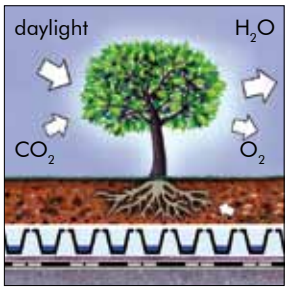
ZinCo

Life on Roofs

Why have a Green Roof?

Beyond their attractive visual nature, Green Roofs offer many undisputable benefits, both ecological and economical, provided they are built with the right system.

Improve the Microclimate

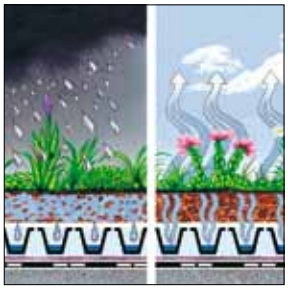


Green Roofs cool and humidify the surrounding air. Thus they contribute to improving the microclimate in urban centres. This cooling effect significantly increases the performance of air-conditioning systems, reducing carbon emissions.

Bind Dust and Toxic Particles

Green Roof vegetation helps to filter out dust and smog particles. Nitrates and other harmful materials are absorbed by the plants out of the air and rainfall and bound within the substrate.

Increase Rainwater Retention

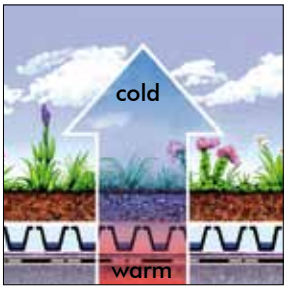


A Green Roof can reduce water run-off by 50–90%; any water flows from the roof with a delay.
Outlets, pipes and drains can be reduced in capacity, thereby saving construction costs. Sewer costs can be reduced in some areas.

Improve Noise Protection

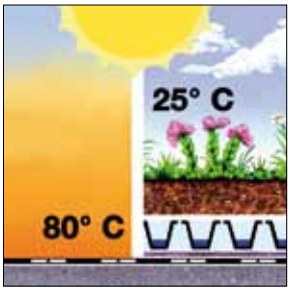
Planted areas are natural sound insulators and absorb more sound than hard surfaces. Green Roofs reduce reflective sound by up to 3 dB and improve sound insulation by up to 8 dB. This is very effective for buildings near airports, noisy nightclubs and factories.

Reduce of Energy Costs



A Green Roof has the ability to buffer temperature extremes and improve the buildings energy performance.

Protect the Waterproofing



A Green Roof protects the waterproofing from climate extremes, UV exposure and mechanical damage.
This greatly increases the life expectancy of the waterproofing and results in reduced maintenance and replacement costs.

Offer a Natural Habitat

Landscaped roofs compensate for green spaces, which are lost to building development. They provide natural habitats for wildlife and bring nature back into the cities.

Provide Additional Space

Green Roofs offer additional space for numerous uses. Whether you want a relaxing garden, a playground or a golf course, it all can be achieved as part of the existing footprint.

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Please note that this English Version of the Planning Guide System Solution is for your information only, but is composed of
1. “German“ Engineering
2. German Trademarks and Patents
and therefore must be adapted to the needs of each market.

Types of Green Roofs

Extensive Green Roof

There are two basic types of Green Roofs with a number of variations. Extensive landscaped roofs are an ecological alternative to conventional surface protection or ballast layers such as gravel and pavers. They are lightweight and have a shallow Build-up height. Suitable plants include various Sedum species, herbs and some grasses.

The aim is, that these systems can cope with the conditions on the roof (sun, wind, drought, etc.) by nature. After establishment of the vegetation, the maintenance is limited to one or two inspections a year.

Extensive Green Roofs

- **minimal maintenance required**
  - inspection 1–2 × / year
  - supply of water and nutrients usually by natural processes
- **adapted plant communities**
  - undemanding, drought-tolerant
  - self-regenerating
- **little weight and shallow build-up height**
  - mainly mineral substrate with depth up to 120 mm
  - weight approx. 50–150 kg/m²

➡ surface protection with ecological functions

Intensive Green Roofs

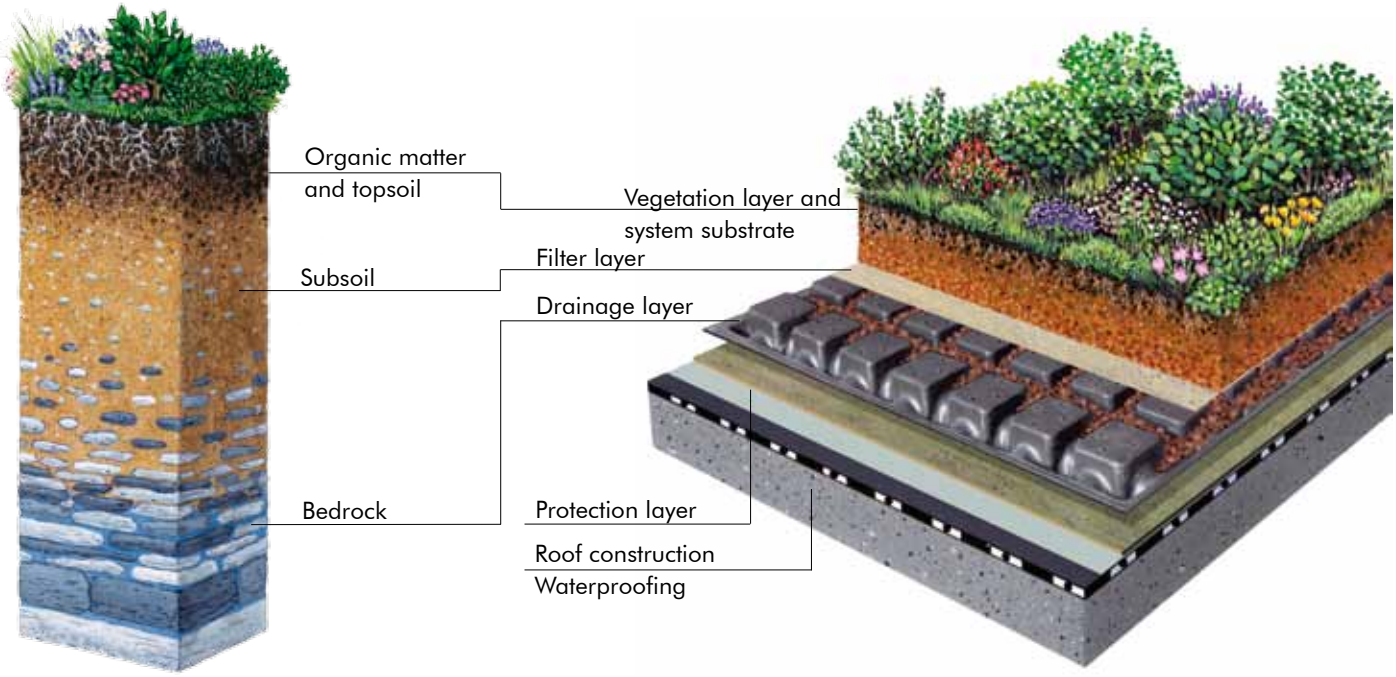
- **regular maintenance required**
  - garden maintenance such as mowing, fertilizing, watering, weeding etc.
- **weight and build-up height depending on plant selection**
  - e. g. ornamental lawn, summer flowers, demanding shrubs, bushes and trees
  - substrate with higher amount of organic material, with depth > 150 mm
  - weight >150 kg/m²

➡ well kept Roof Garden

Intensive Green Roof

Intensive Green Roofs can most easily be compared to building a garden on a roof. They are usually multifunctional and accessible. They require more weight and a deeper System Build-up. The maintenance is regular and depends on the landscape design and the chosen plant material. Depending on the substrate depth, anything is possible from lawns, perennials, shrubs, trees including other landscape options such as ponds, pergolas and patios.

Replicating Nature on Roofs



The Challenge
When designing and installing a Green Roof it is important to provide a growing environment as close as possible to the plants` natural environment. The most important issue is to compensate for the lack of subsoil.

The answer is the ZinCo technology
ZinCo systems are able to retain the necessary quantities of water to support the plants, while draining off the excess. The required amount of water is determined by the plant type, the geographical region and the roof itself. Besides building the correct Green Roof system to support the plants, it is very important to protect the waterproofing from both mechanical damage and attack from plant roots.
ZinCo systems provide solutions to these problems. ZinCo Green Roof systems have been designed to function naturally. The plants receive a stable environment without adversely affecting the waterproofing.

ZinCo Green Roof systems embrace leading edge technologies in the three key elements that combine to ensure successful Green Roofs:

Consulting
- Horticulture & Ecology
- Materials Science
- Building and Landscape Architecture
- Roofing Membranes
- Landscape Contractors

Manufacturing & Design
- Extensive Green Roofs
- Intensive Green Roofs
- Hybrid Solutions

Education & Training
- Seminars, Symposiums, Workshops, CPDs
- Product Data Sheets, Samples, Design

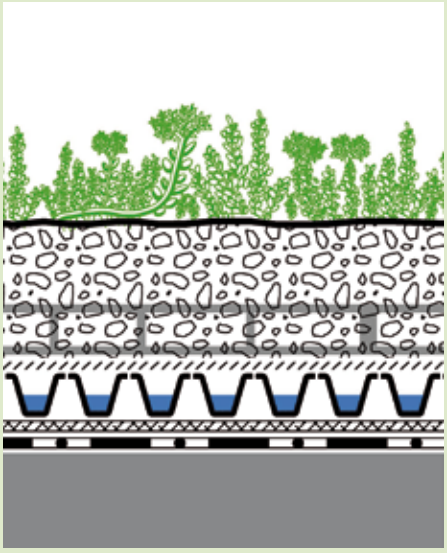
System Build-up "Sedum Carpet"

The "Sedum Carpet" is a standard build-up for extensive Green Roofs. It is a shallow and lightweight Green Roof type with an attractive "back-to-nature" appearance, that requires little maintenance.
Floradrain® FD 25-E is the appropriate drainage and waterstorage element for this system. It has the necessary compressive strength, a low profile height, little weight and is walkable.
Proven Sedum species, in combination with the adapted substrate and System Build-up, guarantee a durable Green Roof.
The System Substrate "Sedum Carpet" is particularly suitable for extensive Green Roofs as well as the plant community "Sedum Carpet", containing various low-growing Sedum species that are wind and frost-resistant.
The main blooming time is early summer with yellow, red and white flowers dominating. During the year, "Sedum Carpet" is represented in various shades of green. Red shades show particularly in autumn and are a nice change in the Green Roof´s appearance.
Sedum cuttings can be a cost-effective to vegetate a roof if this option ist locally available.

System Build-up "Sedum Carpet"

Features:

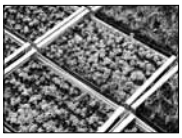
- Ecological protection layer instead of gravel covering.
- Requires minimum maintenance.
- For roofs without standing water and with a slight slope up to 8°.



Plug Plants FB 50 "Sedum Carpet"
16 pcs/m² or
Sedum Cuttings 60 g/m², if available

System Substrate "Sedum Carpet"
≥ 80 mm*
Fallnet®
Filter Sheet SF
Floradrain® FD 25-E
Protection Mat SSM 45
Root Barrier, if waterproofing is not root-resistant

* if there is enough rainfall, maybe less

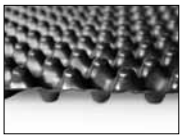


	Art.-No.	Unit
Sedum Cuttings	8020	bag of 2 kg
Plug Plants FB 50 "Sedum Carpet"	8110	tray with 50 pcs.

	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Sedum Carpet"	big bag	611101	bulk	611201	silo	611301

This System Build-up allows the integration of the **Fallnet® Fixing Device** for roofs with slopes up to 5° (see page 34–35)

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m²-roll	4600 m²
	2102	ca. 1.00 m × 100.00 m	100 m²-roll	2500 m²
	2101	ca. 2.00 m × 10.00 m	20 m²	



	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 25-E	3028	ca. 1.00 m × 2.00 m	2 m²-board	300 boards
Floradrain® FD 25-R (Roll)	3023	ca. 1.00 m × 15.00 m	15 m²-roll	
Floradrain® FD 25-RV (Roll & Filter Sheet)	3022	ca. 1.00 m × 15.00 m	15 m²-roll	

	Art.-No.	Dimensions	Unit
Protection Mat SSM 45	2045	ca. 2.00 m × 50.00 m	100 m²-roll

If the waterproofing is not root resistant, the Root Barrier WSF 40 is required as a bottom layer of the System Build-up.
If the System Build-up is to be in compliance with the ETA standard, the Root barrier WSB 100-PO must be used instead.

European Technical Assessment
"Kits for Green Roofs"
CE ETA-13/0668

System Build-ups with European Technical Assessment.
Details can be found here: www.zinco-greenroof.com/european-technical-assessment

System Build-up “Rockery Type Plants”

Extensive Green Roofs call for plant communities that can easily deal with sun, wind and drought. The System Build-up “Rockery Type Plants” leads to an extensive Green Roof with sophisticated design and individual character. The substrate has a minimum depth of 80 mm and vegetation consists of various species which provide a long blooming period and set different accents throughout the vegetation period.

Water and nutrients are mostly supplied through natural processes. Rainfall collects in the Floradrain® storage cells and roots are provided with water through diffusion. Water is also stored in the protection mat. The Floradrain® element provides continous drainage for any excess water.

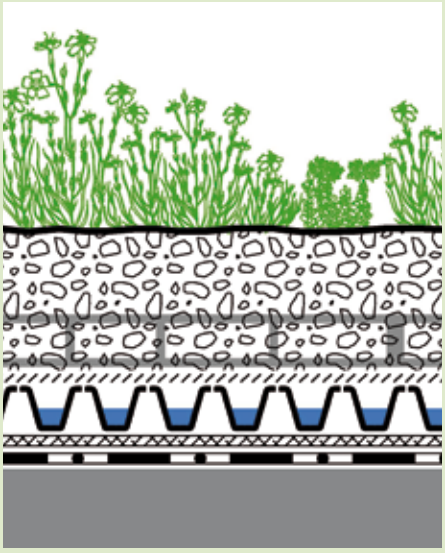
Sedum species and other perennials are primarily used as a ground cover. The vegetation of “Rockery Type Plants” is achieved by root ball plants. Hand-planting ensures that the design agrees with the landscaping drawings.

The System Build-up “Rockery Type Plants” can also be combined with seed-sowing. Different seed mixtures, such as “Meadow Scents”, “Country Colours” and “Grassy Pasture” provide Green Roofs with attractive “back to nature” appearance.

System Build-up
"Rockery Type Plants"

Features:

- Extensive Green Roof with a large variety of species as an ecological protection layer instead of gravel covering.
- Design options through plug planting according to plant list "Rockery Type Plants".
- For roofs without standing water and with a slight slope up to 8°.
- Requires minimum maintenance; various designs and combinations with walkways and patios are possible.



Plug Plants FB 50 "Rockery Type Plants"
16 pcs/m²

System Substrate "Rockery Type Plants"
≥ 80 mm*

Fallnet®

Filter Sheet SF

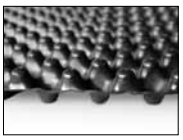
Floradrain® FD 25-E
Protection Mat SSM 45
Root Barrier, if waterproofing is not root-resistant
* if there is enough rainfall, maybe less

	Art.-No.	Unit
Plug Plants FB 50 "Rockery Type Plants"	8120	tray with 50 pieces

	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Rockery Type Plants"	big bag	612101	bulk	612201	silo	612301

This System Build-up allows the integration of the **Fallnet® Fixing Device** for roofs with slopes up to 5° (see page 34–35)

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m²-roll	4600 m²
	2102	ca. 1.00 m × 100.00 m	100 m²-roll	2500 m²
	2101	ca. 2.00 m × 10.00 m	20 m²	



	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 25-E	3028	ca. 1.00 m × 2.00 m	2 m²-board	300 boards
Floradrain® FD 25-R (Roll)	3023	ca. 1.00 m × 15.00 m	15 m²-roll	
Floradrain® FD 25-RV (Roll & Filter Sheet)	3022	ca. 1.00 m × 15.00 m	15 m²-roll	

	Art.-No.	Dimensions	Unit
Protection Mat SSM 45	2045	ca. 2.00 m × 50.00 m	100 m²-roll

If the waterproofing is not root resistant, the Root Barrier WSF 40 is required as a bottom layer of the System Build-up.
If the System Build-up is to be in compliance with the ETA standard, the Root barrier WSB 100-PO must be used instead.

European Technical Assessment
"Kits for Green Roofs"
CE ETA-13/0668

System Build-ups with European Technical Assessment.
Details can be found here: www.zinco-greenroof.com/european-technical-assessment

System Build-up "Irrigated Extensive Roof"

The green roof build-up "Irrigated Extensive Roof" is a cost-effective solution for a permanent proper functioning of green roofs in dry climates.

Automated irrigation of extensive green roof areas is very common in regions like the Mediterranean, as there are long periods of dry and hot weather.

The climate is changing and as a consequence many regions more recently have to deal with increasingly long periods of drought. Without an irrigation system this can lead to species-poor green roofs and perhaps bare patches that are only temporarily green. Under such conditions irrigation is the only way to achieve a reasonable biodiversity on green roofs.
The irrigation is used when the vegetation is enrooting and until adapted to the new environment. Once the vegetation is well established the irrigation can be reduced to a more selective use during dry periods.

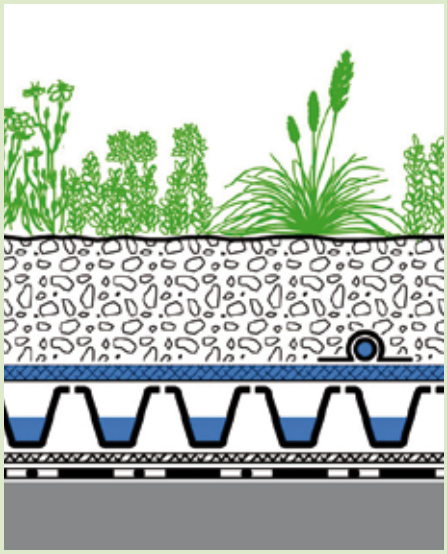
The root zone irrigation humidifies the growing medium from below through capillarity. This improves the entire water distribution in a well-draining green roof growing medium, compared to a conventional irrigation through drip lines on the surface. Furthermore in this comparison the integrated system needs less linear meter of drip lines and less drippers, which improves the cost-effectiveness.

The use of treated grey-water or harvested rainwater is an option to minimize the use of other water sources.

System Build-up
"Irrigated Extensive Roof"

Features:

- Biodiversity and long-term greening success are achieved through targeted underground irrigation.
- Irrigation takes place via special dripperlines which are fastened to the Aquafleece AF 300 at a distance of 500 mm.
- Needs to be connected to an irrigation manager.
- It is possible to seed grasses / herbal mixtures during favourable seasons. For this purpose, a top layer with 10 l/m² of Zincohum® is applied.



Plug Plants FB 50 "Rockery Type Plants" or "Country Colours"

System Substrate "Rockery Type Plants" from 80 mm

Dripperline 500-L2
Aquafleece AF 300
e. g. Floradrain® FD 40-E

Protection Mat SSM 45

	Art.-No.	Unit
Plug Plants FB 50 "Rockery Type Plants"	8120	tray with 50 pieces

	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Rockery Type Plants"	big bag	612101	bulk	612201	silo	612301

	Art.-No.	Dimensions	Unit
Aquafleece AF 300	2120	ca. 2.00 m × 50.00 m	105 m² roll

	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 40-E	3041	ca. 0.96 m × 2.08 m	2 m²-board	250 boards
Floradrain® FD 40-RV (Roll & Filter Sheet)	3042	ca. 0.94 m × 10.70 m	10 m²-roll	

	Art.-No.	Dimensions	Unit
Protection Mat SSM 45	2045	ca. 2.00 m × 50.00 m	100 m²-roll

If the waterproofing is not root resistant, the Root Barrier WSF 40 is required as a bottom layer of the System Build-up.

System Build-up “Meadow Scents” on 0°-Roofs

As a general rule, flat roofs should be laid to fall of at least 2°. This is particularly important when designing an extensive Green Roof with a shallow drainage and substrate layer as any deflection in the deck allowing water to pond above the drainage layer will be harmful to the plants.

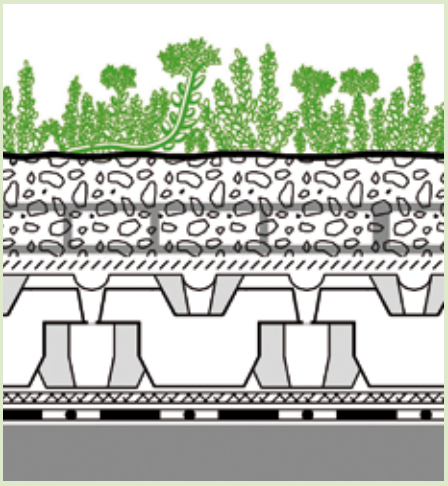
However, Green Roofs can be installed on zero degree roofs where deeper puddles remain, provided that the correct build-up is designed to avoid the danger of ponding water on vegetation level.

System Build-ups for extensive Green Roofs are to be adapted to these requirements. By using Floraset®, a deeper drainage element (50 or 75 mm), the necessary distance between the water level and the vegetation layer is ensured. The System Build-up is higher compared to a standard build-up, but has a similar weight.
The Floraset® elements are made of expanded polystyrene thus they are light-weight.

System Build-up
"Meadow Scents" on 0°-Roofs

Features:

- For 0°-Roofs with standing water; can also be used for roofs with a slight slope up to 10°.
- The plant covering is realized by sowing a seed mixture of "Meadow Scents"and Sedum Cuttings.
- Requires minimum maintenance; offers a great variety of Sedum species and drought resistant grasses.



Seed mixture "Meadow Scents" 15 g/m²
and Sedum Plug Plants

System Substrate "Rockery Type Plants"
≥ 80 mm

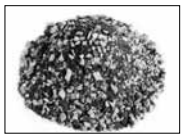
Fallnet®
Filter Sheet SF

Floraset® FS 50 (FS 75)

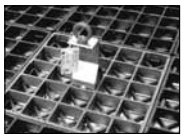
Protection Mat TSM 32
Root Barrier, if waterproofing
is not root-resistant

	Art.-No.	Unit
Seed Mixture "Meadow Scents"	8003	bag of 0.5 kg
	8004	bag of 1.0 kg
	8005	bag of 2.0 kg
	8006	bag of 5.0 kg

	Art.-No.	Unit
Sedum Cuttings	8020	bag of 2 kg
Plug Plants FB 50 "Sedum Carpet"	8110	tray with 50 pcs.



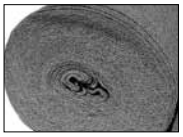
	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Rockery Type Plants"	big bag	612101	bulk	612201	silo	612301



This System Build-up allows the integration of the **Fallnet® Fixing Device** for roofs with slopes up to 5° (see page 34–35)

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m²-roll	4600 m²
	2102	ca. 1.00 m × 100.00 m	100 m²-roll	2500 m²
	2101	ca. 2.00 m × 10.00 m	20 m²	

	Art.-No.	Dimensions	Unit	Pallet
Floraset® FS 50	3052	ca. 1.00 m × 1.00 m	1 m²-board	54 boards
Floraset® FS 75	3076	ca. 1.00 m × 1.00 m	1 m²-board	40 boards



	Art.-No.	Dimensions	Unit
Protection Mat TSM 32	2032	ca. 2.00 m × 50.00 m	100 m²-roll

If the waterproofing is not root resistant, the Root Barrier WSF 40 is required as a bottom layer of the System Build-up.

System Build-up on Inverted Roofs

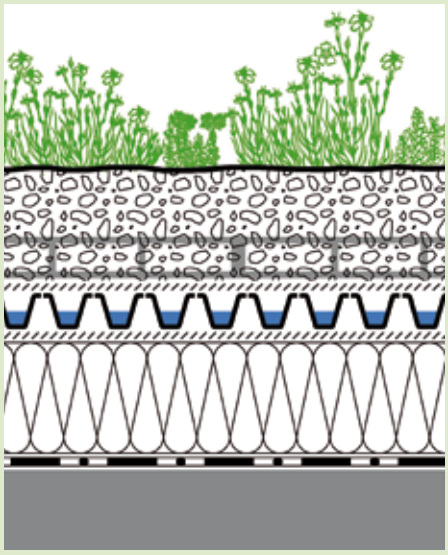
The characteristic of an inverted roof is that the insulation is installed above the waterproofing. Insulation material which is used for this kind of roof is impervious to water, but not to water vapour. Forming a vapour barrier directly above it when installing a Green Roof must therefore be avoided.

Layers that prevent moisture from diffusing out mustn't be installed over the thermal insulating XPS boards and the layer above should be vapour permeable. The protection mat has to be replaced by the permeable separation membrane TGV 21. If a root barrier is required, it has to be placed below the insulation directly onto the waterproofing.
A deeper substrate layer compensates for the water retention capacity of the missing protection mat and prevents wind uplift of the insulation boards.

System Build-up "Rockery Type Plants" on Inverted Roofs

Features:

- Build-up for inverted roofs allowing diffusion and vaporisation.
- Extensive Green Roof with a large variety of species as an ecological protection layer instead of gravel covering.
- Planting with Plug Plants according to plant list "Rockery Type Plants".
- For roofs without standing water and with a slight slope up to 8°.
- Requires minimum maintenance.
- Various designs and combinations with walkways and patios are possible.



Plug Plants FB 50 "Rockery Type Plants"
16 pcs/m²
System Substrate "Rockery Type Plants"
≥ 80 mm
Fallnet®
Filter Sheet SF
Floradrain® FD 25-E
Separation Membrane TGV 21
Thermal Insulation XPS

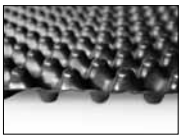
Root Barrier, if waterproofing is not root-resistant

	Art.-No.	Unit
Plug Plants FB 50 "Rockery Type Plants"	8120	tray with 50 pcs.

	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Rockery Type Plants"	big bag	612101	bulk	612201	silo	612301

This System Build-up allows the integration of the **Fallnet® Fixing Device** for roofs with slopes up to 5° (see page 34–35)

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m²-roll	4600 m²
	2102	ca. 1.00 m × 100.00 m	100 m²-roll	2500 m²
	2101	ca. 2.00 m × 10.00 m	20 m²	



	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 25-E	3028	ca. 1.00 m × 2.00 m	2 m²-board	300 boards
Floradrain® FD 25-R (Roll)	3023	ca. 1.00 m × 15.00 m	15 m²-roll	
Floradrain® FD 25-RV (Roll & Filter Sheet)	3022	ca. 1.00 m × 15.00 m	15 m²-roll	

	Art.-No.	Dimensions	Unit	Pallet
Separation Membrane TGV 21	2180	ca. 1.60 m × 250.00 m	400 m²-roll	3600 m²
	2185	ca. 1.60 m × 50.00 m	80 m²-roll	1600 m²

If the waterproofing is not root resistant, the Root Barrier WSF 40 is required as a bottom layer under the XPS insulating boards. If the System Build-up is to be in compliance with the ETA standard, the Root barrier WSB 100-PO must be used.

European Technical Assessment
"Kits for Green Roofs"
CE ETA-13/0668

System Build-ups with European Technical Assessment.
Details can be found here: www.zinco-greenroof.com/european-technical-assessment

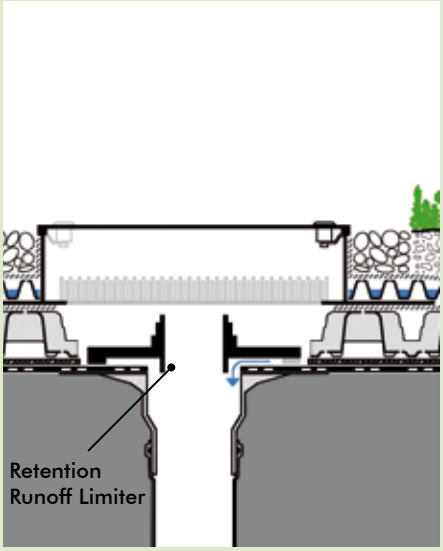
System Build-up "Stormwater Management Roof"

The word "retention" in water management refers to the balancing effect of storage space on the run off of stormwater into watercourses. The need for retention is becoming more frequent as changing weather conditions (e.g. severe local rain events) can lead to surface floodings due to overloaded drainage system.
First of all, a large proportion of the precipitation is retained on the roof area with a stormwater management roof, in the full sense of expanded flood control, and is then released over a pre-defined period (e.g. 24 hours) into the drainage system. All elements that are important for the correct functioning of the green roof are preserved (water storage for the plants, air-water household in the root area, etc.).

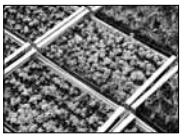
System Build-up
"Stormwater Management Roof"
for example "Sedum Carpet"

Features:

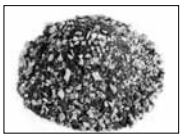
- System Build-up combining benefits of an extensive green roof and efficient stormwater management.
- Stormwater builds up to a predetermined depth and drains at a desired maximum rate.
- Instead of "Sedum Carpet" the green roof solutions "Rockery Type Plants" or "Heather with Lavender" can be applied over the Spacer Elements. Build-up height, weight and maintenance intensity differ accordingly.



Plant level "Sedum Carpet"
System Substrate "Sedum Carpet"
Filter Sheet SF
Floradrain® FD 25-E
Filter Sheet PV
Retention-Spacer RS 60
Filter Sheet PV

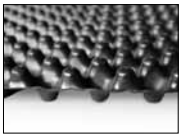


	Art.-No.	Unit
Sedum Cuttings	8020	bag of 2 kg
Plug Plants FB 50 "Sedum Carpet"	8110	tray with 50 pcs.

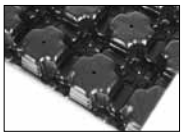


	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Sedum Carpet"	big bag	611101	bulk	611201	silo	611301

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m² -roll	4600 m²
	2102	ca. 1.00 m × 100.00 m	100 m²-roll	2500 m²
	2101	ca. 2.00 m × 10.00 m	20 m²	



	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 25-E	3028	ca. 1.00 m × 2.00 m	2 m²-board	300 boards
Floradrain® FD 25-R (Roll)	3023	ca. 1.00 m × 15.00 m	15 m²-roll	
Floradrain® FD 25-RV (Roll & Filter Sheet)	3022	ca. 1.00 m × 15.00 m	15 m²-roll	



	Art.-No.	Dimensions	Unit	Pallet
Retention-Spacer RS 60	3408	ca. 2.30 m × 1.03 m (netto 2.25 m × 1.00 m)	board à 2.25 m²	100 boards

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet PV	2131	ca. 2.00 m × 50.00 m	100 m²-roll	900 m²

	Art.-No.	Unit
Retention Runoff Limiter Set 28	4000	Set
Retention Runoff Limiter Set 48	4002	Set

System Build-up "Urban Climate Roof"

With global warming, the increase in sealed surfaces and the radiation from buildings, industry, and traffic, the temperatures within cities are constantly rising.

Natural "air conditioners" such as green areas and parks provide soil humidity and plant evapotranspiration, but in densely populated districts green space is rare.

The System Build-up "Urban Climate Roof" is designed for maximum evapotranspiration which can actively contribute to urban climate control, especially during dry and hot periods.

The implementation of this system in entire housing developments can improve the well-being and the quality of life of their residents.

The use of special plants according to the plant list "Urban Climate Roof" allows for maximized evapotranspiration in comparison to traditional plant communities, however, without losing sight of the maintenance requirements.

To minimize the use of precious water sources it is recommended to integrate rainwater harvesting or the use of treated grey water if possible.

The plant selection for this system was developed in a science project with special regard to compatibility with alternative water sources.

System Build-up
"Urban Climate Roof" with
Floradrain® FD 40-E

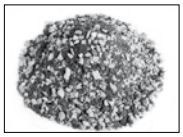
Features:

- The System Build-up "Urban Climate Roof" is designed for maximum evapotranspiration.
- Integrated irrigation within the root zone.
- The use of treated grey-water or harvested rainwater is an option to minimize the use of other water sources.

Plant community "Urban Climate Roof"

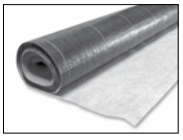
System Substrate "Rockery Type Plants"
Dripperline 500-L2
Aquafleece AF 300
Floradrain® FD 40-E
Protection Mat SSM 45

Plant community "Urban Climate Roof"	on request					

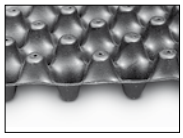


	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Rockery Type Plants"	big bag	612101	bulk	612201	silo	612301

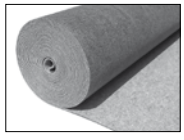
	Art.-No.	Dimensions	Unit	Pallet
Dripperline 500-L2	9350	Ø ca. 16 mm	200 m roll	36 rolls



	Art.-No.	Dimensions	Unit
Aquafleece AF 300	2120	ca. 2.00 m × 50.00 m	105 m² roll



	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 40-E	3041	ca. 0.96 m × 2.08 m	2 m²-board	250 boards
Floradrain® FD 40-RV (Roll & Filter Sheet)	3042	ca. 0.94 m × 10.70 m	10 m²-roll	



	Art.-No.	Dimensions	Unit
Protection Mat SSM 45	2045	ca. 2.00 m × 50.00 m	100 m²-roll

System Build-up "Pitched Green Roof"

In general, flat roofs should have a slope of at least 2%. Pitched roofs, as described in this brochure, start with a slope of 10° (18%). From 10° on, the Green Roof System Build-up differs significantly from System Build-ups below 10°. Shear forces increase with the roof slope and have to be transfered into stable beams.
The substrate layer has to be protected against erosion. Plant selection and planting methods are to be adjusted to the relevant slope and exposure.

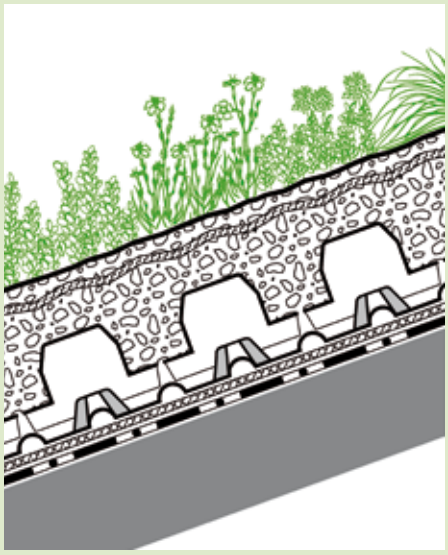
A professionally waterproofed roof surface, e.g. with bituminous or highpolymer membranes, is a precondition for a durable long-lasting Green Roof. The waterproofing should be root-resistant and a protection mat with high water storage is needed. Floraset® FS 75, a multi-functional drainage element of expanded polystyrene is the perfect element for Pitched Green Roofs. It is very important to take the Green Roof upkeep and maintenance aspects into account from the early planning stage of the project on. Skylights can be installed as access for the maintenance personnel.

For more detailed information on sloped green roofs please refer to the ZinCo planning guide "Systems for Pitched Green Roofs". Download available at *www.zinco-greenroof.com/downloads*

System Build-up
"Pitched Green Roof"

Features:

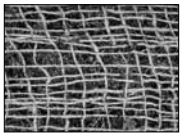
- Proven system, low maintenance, requires root-proof waterproofing on roofs with slopes between 10° and 25°.
- Floraset® elements retain the substrate and prevent it from sliding off.
- The elements transfer shear forces into the roof construction; eaves and shear barriers have to be in compliance with the structural design.



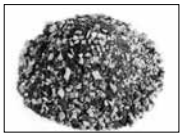
Plug Plants FB 50 "Pitched Roof"
24 pcs/m²
Jute Anti-Erosion Net JEG (> 15° slope)
System Substrate "Rockery Type Plants"
≥ 50 mm above element

Floraset® FS 75
Protection Mat BSM 64

	Art.-No.	Unit
Plug Plants FB 50 "Pitched Roof" (ca. 10°–20°)	8121	tray with 50 pieces



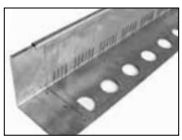
	Art.-No.	Dimensions	Unit	Pallet
Jute Anti-Erosion Net JEG	2856	ca. 70.00 m × 1.22 m	85.4 m² -bale	683.2 m²



	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Rockery Type Plants"	big bag	612101	bulk	612201	silo	612301

	Art.-No.	Dimensions	Unit	Pallet
Floraset® FS 75	3076	ca. 1.00 m × 1.00 m	1 m²-board	40 boards

	Art.-No.	Dimensions	Unit
Protection Mat BSM 64	2064	ca. 2.00 m × 25.00 m	50 m²-roll



	Art.-No.	Dimensions	Unit
Eaves Profile TRP 140	7782	length 3 m, height 140 mm	piece

	Art.-No.	Unit
Support Bracket TSH 100	9565	piece

	Art.-No.	Unit
Shear Fix LF 300	9568	piece

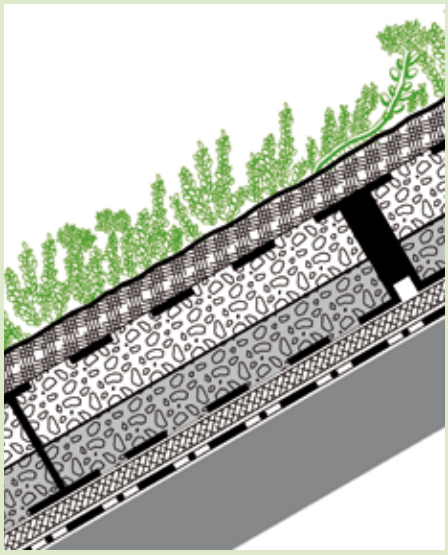
System Build-up "Steep Pitched Green Roof"

The System Build-up "Steep Pitched Green Roof", based on the Georaster® elements, enables the installation of Green Roofs with slopes exceeding 20° and up to 35°. Above 35° special solutions can be designed by the ZinCo engineers. The Georaster® elements are made of recycled polyethylene (HD-PE) and interlock without requiring tools, creating a stable structure. This structure is safely accessible and can be infilled with system substrate. The Georaster® elements allow for plenty of space for the plant root systems to establish and develop. The plant selection has to be well adapted to the extreme conditions of Steep Pitched Green Roofs, where the solar radiation is the highest on the south facing roof side and the water run off is much faster than of a flat roof. The irrigation should be planned for, even if it is only needed in times of drought. It can avoid gaps in the vegetation coverage, which would lead to erosion. A transfer of existing shear forces into stable eaves and into additional shear barriers is necessary.
Georaster® elements can also be installed under reinforced lawns, footway constructions, in slope protection, etc.

System Build-up
"Steep Pitched Green Roof"

Features:

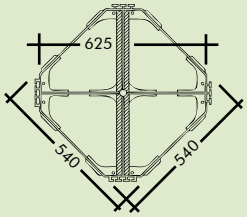
- Attractive pitched Green Roofs for root-proof and waterproofed roofs with slopes between 20° and 35°.
- Georaster® elements transfer the shear forces into the eaves or into additional shear barriers. (e. g. Shear Fix LF 300)
- Pitched Green Roofs require periodic maintenance. Depending on the location, slope and exposure, additional irrigation may be necessary.
- Vegetation may develop differently on the north and the south side.



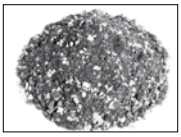
Vegetation Mat "Sedum Carpet" ≥ 30°
or Plug Plants FB 50 "Steep Pitched Green Roof" 32 pcs/m² ≤ 30°

System Substrate
"Heather with Lavender-light"
(≥10 mm above element)

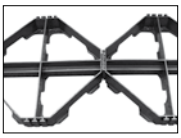
Georaster®
Protection Mat WSM 150



	Art.-No.	Unit
Plug Plants FB 50 "Steep Pitched Roof" (ca. 20°–30°)	8122	tray with 50 pieces
or Vegetation Mat "Sedum Carpet"	8030	mat of 2 m²

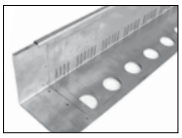


	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Heather with Lavender-light"	big bag	614401	bulk	614501	silo	614601

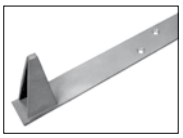


	Art.-No.	Dimensions	Unit	Pallet
Georaster®	3400	ca. 0.54 m × 0.54 m	piece	96 pieces

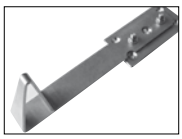
	Art.-No.	Dimensions	Unit
Protection Mat WSM 150	2015	ca. 1.00 m × 15.00 m	15 m²-roll



	Art.-No.	Dimensions	Unit
Eaves Profile TRP 140	7782	length 3 m, height 140 mm	piece



	Art.-No.	Unit
Support Bracket TSH 100	9565	piece



	Art.-No.	Unit
Shear Fix LF 300	9568	piece

	Art.-No.	Unit
Shear Fix LF 600	9569	piece

System Build-up “Heather with Lavender”

“Heather with Lavender” is the ideal build-up for simple intensive Green Roofs with blooming perennials and fragrant herbs. The plant community “Heather with Lavender” contains ground covering plants, fragrant herbs and small shrubs such as thyme, oregano and lavender.

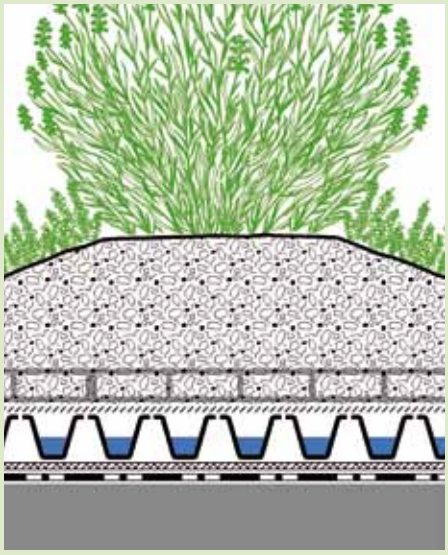
This plant selection forms a drought resistant and visually pleasant vegetation. The “Heather with Lavender” system substrate, specifically designed for this plant community, is used in combination with the water retention and drainage element Floradrain® FD 40-E to create the ideal habitat conditions for this vegetation.

Floradrain® FD 40-E is a universal element for both extensive and intensive build-ups. It has a high drainage capacity and is also suitable for roofs without slope, provided residual ponding is less than 40 mm to keep the substrate clear of the water beneath. It is quick and easy to install as well as walkable.

System Build-up
"Heather with Lavender"

Features:

- Attractive Green Roof with perennials, grasses and scented herbs such as Lavender, Thyme and Oregano.
- Installation on flat and slightly pitched roofs with a slope up to 8°.
- By shaping the substrate layer, a variety of landscapes can be created. During dry season additional irrigation is necessary.
- Various designs and combinations with walkways and patios are possible.
- Requires medium maintenance.

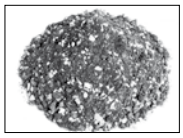


Plug Plants
"Heather with Lavender"

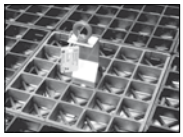
System Substrate "Heather with Lavender"
100 mm–150 mm

Fallnet®
Filter Sheet SF
Floradrain® FD 40-E
Protection Mat SSM 45
Root Barrier WSB 100-PO, if waterproofing is not root-resistant

Pre-cultivated plug plants for the System Build-up "Heather with Lavender" are available at perennial nurseries.



	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Heather with Lavender"	big bag	614101	bulk	614201	silo	614301



This System Build-up allows the integration of the **Fallnet® Fixing Device** for roofs with slopes up to 5° (see page 34–35)

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m²-roll	4600 m²
	2102	ca. 1.00 m × 100.00 m	100 m²-roll	2500 m²
	2101	ca. 2.00 m × 10.00 m	20 m²	

	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 40-E	3041	ca. 0.96 m × 2.08 m	2 m²-board	250 boards
Floradrain® FD 40-RV (Roll & Filter Sheet)	3042	ca. 0.94 m × 10.70 m	10 m²-roll	

	Art.-No.	Dimensions	Unit
Protection Mat SSM 45	2045	ca. 2.00 m × 50.00 m	100 m²-roll

If the waterproofing is not root resistant, the Root Barrier WSB 100-PO is required as a bottom layer of the System Build-up.

European Technical Assessment
"Kits for Green Roofs"
CE ETA-13/0668

System Build-ups with European Technical Assessment.
Details can be found here: www.zinco-greenroof.com/european-technical-assessment

System Build-up “Roof Garden”

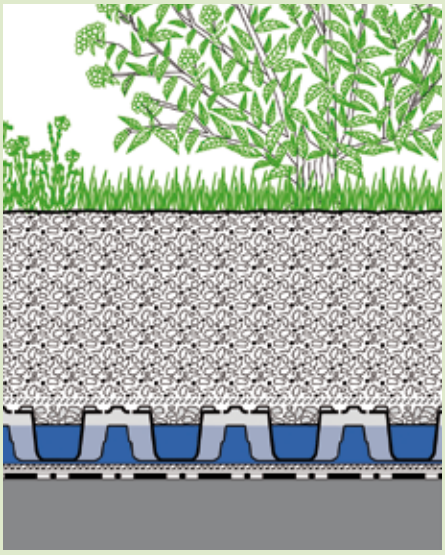
The “Roof Garden” is a multifunctional Green Roof build-up with high water storage. It is suitable for lawns, perennial plants, and with deeper system substrate, for shrubs and trees. The Roof Garden build-up allows a variety of design concepts, even water features. It is also possible to integrate hard landscapes, such as walkways, terraces, driveways or play areas, etc.

Within the Roof Garden, it is useful to store as much rainwater as possible to reduce the need for additional irrigation. The spacious channels forming the underside of the Floradrain® FD 60 neo provide for a 40 mm deep water reservoir underneath the system substrate throughout the roof area. This water reaches the plants by capillary action and diffusion. Water storage can also be easily achievedby installing roof dam elements above the roof outlets. A roof laid at 0° fall is required to include this system, along with a suitable waterproofing membrane for such use. Inspection chambers make it possible to examine and maintain the roof dam elements at any time. With automatic irrigation, a minimum water storage can be maintained even in periods of drought.

System Build-up "Roof Garden"

Features:

- Multifunctional Green Roof System Build-up with high water retention capacity and roof dam irrigation.
- Suitable for lawn and perennials; with a deeper substrate level also for bushes, small trees etc.
- Various combinations are possible, for example with walkways, patios, driveways or playgrounds.
- Floradrain® FD 60 neo can be filled with concrete as a sub-construction for driveways without penetrating the waterproofing or interrupting the drainage.



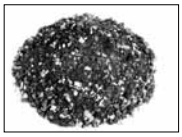
Lawn and perennials; with a deeper substrate level, bushes and small trees

System Substrate "Roof Garden"
≥ 200 mm

Filter Sheet SF
Floradrain® FD 60 neo with
Zincolit® Plus infill
Protection Mat ISM 50

Root Barrier WSB 100-PO,
if waterproofing is not root-resistant

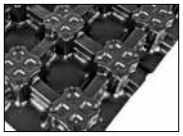
Suitable plants for the System Build-up "Roof Garden" are available at perennial or tree nurseries.



	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Roof Garden"	big bag	616101	bulk	616201

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m² -roll	4600 m²
	2102	ca. 1.00 m × 100.00 m	100 m²-roll	2500 m²
	2101	ca. 2.00 m × 10.00 m	20 m²	

	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
Zincolit® Plus	big bag	607102	bulk	607202	silo	607302



	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 60 neo	3062	2.30 m × 1.03 m aprox. (neto 2.25 × 1.00 m)	board 2.30 m²	450 m²

	Art.-No.	Dimensions	Unit
Protection Mat ISM 50	2050	ca. 2.00 m × 25.00 m	50 m²-roll

	Art.-No.	Dimensions	Unit	Pallet
Root Barrier WSB 100-PO	1084	ca. 2.44 m × 30.50 m	74.4 m²-roll	1116 m²

	Art.-No.	Unit
Dam-up elmement CU	4140	piece
Dam-up elmement PE	4142	piece

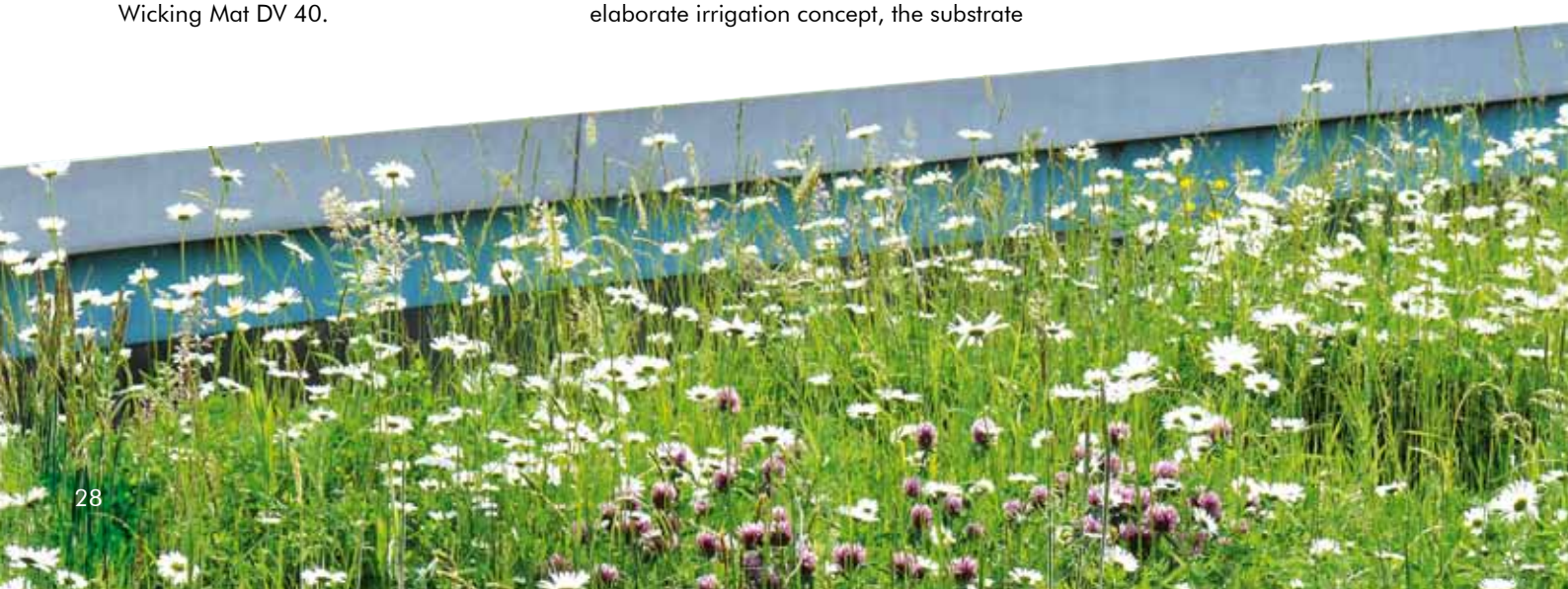
	Art.-No.	Height	Unit
Irrigation Unit B 32	4031	ca. 300 mm	piece

European Technical Assessment
"Kits for Green Roofs"
CE ETA-13/0668

System Build-ups with European Technical Assessment.
Details can be found here: www.zinco-greenroof.com/european-technical-assessment

System Build-up "Roof Garden" with Aquatec® AT 45

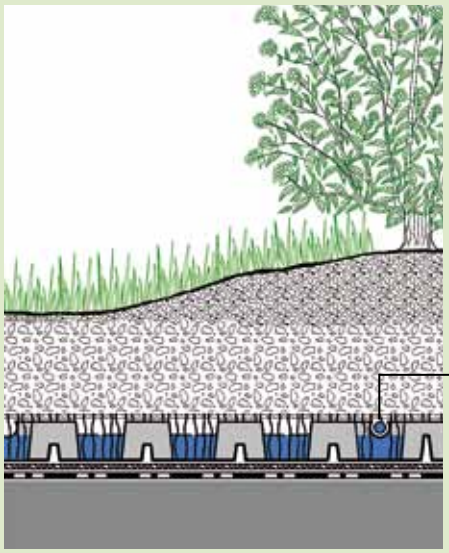
To date, intensive green roofs were irrigated either from above with a water sprinkler, within the substrate layer using drip-irrigation or from below through dam-up irrigation. All those methods have limitations, such as high water consumption, soil erosion, uneven water distribution, restricted application area, etc.
What is more, a traditional intensive green roof implies a minimum of 200 mm of system substate. This results in a minimum weight of 300 kg/m² that not all roofs can bear.
With its System Build-up "Roof Garden" with Aquatec AT 45, ZinCo is treading a new path. It pushes out these boundaries and reinvents capillary irrigation.
This system consists of a water retaining element called Aquatec® AT 45 (patent pending), irrigation pipes that are clipped into the Aquatec® elements and the Wicking Mat DV 40.
It is based on an optimal water distribution and retention within the Aquatec® AT45. The water is fed into its channels and cells. It is drawn upwards by the wicks of the wicking mat and is then made available to the substrate, thus the plants. This build-up can be installed on flat and sloped roofs up to 5° pitch, even on inverted roofs.
The water consumption is considerably lower with this type of irrigation. Compared to overhead irrigation, there is nearly no surface evaporation because the water is directly available within the root area. Compared to drip-irrigation, significantly fewer pipes are required as the water is easily distributed throughout the whole Aquatec® area. Ingenious control technology regulates the water flow, as required. Furthermore, Aquatec® AT 45 needs no infill and owing to the elaborate irrigation concept, the substrate depth can be considerably reduced, hence the overall build-up weight is lower.
A lawn, for example, can be achieved with just 100 mm of system substrate, allowing for installation on many roofs that would not withstand the weight of a standard system. The vegetation layer may consist of lawn, perennials and small shrubs (over substrate mounds). In case of ready lawn it is important that it was grown on a sandy and permeable soil!
For maximized water retention capacity, given a sufficient load bearing capacity, the system substrate lawn can be used for all above mentioned forms of vegetation in a substrate depth of 150 mm to 200 mm. For seeding a topping layer with approx. 10 l/m² Zincohum® is recommended, which can be omitted otherwise.



System Build-up "Roof Garden" with Aquatec® AT 45

Features:

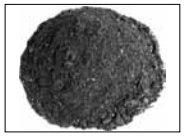
- Intensive Green Roof with a variety of design options.
- Installation on flat roofs as well as on inverted roofs (slope max 5°).
- Minimal Substrate depth required.
- Tailored minimal irrigation possible.



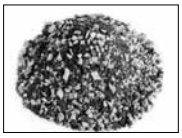
Lawn, perennials and small shrubs (over substrate mounds)

System Substrate "Sedum Carpet" 100–150 mm + 15 l/m² Zincohum®
Dripperline 100-L1
Wicking Mat DV 40
Aquatec® AT 45
Filter Sheet PV
Root Barrier WSB 100-PO, if waterproofing is not root-resistant

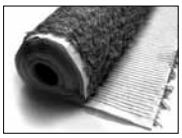
Pre-cultivated plug plants for the System Build-up "Roof Garden with Aquatec®" are available at perennial nurseries.



	Unit	Art.-No.	Unit	Art.-No.
Zincohum®	big bag	605101	bulk	605201



	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Sedum Carpet"	big bag	611101	bulk	611201	silo	611301

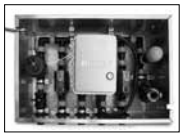


	Art.-No.	Dimensions	Unit
Wicking Mat DV 40	2160	ca. 2.10 m × 25.00 m	50 m²-roll
	2165	ca. 2.10 m × 10.00 m	20 m²-roll

	Art.-No.	Dimensions	Unit	Palett
Aquatec®AT 45	3345	ca. 1.02 m × 2.02 m	2 m² board	135 boards

	Art.-No.	Dimensions	Unit	Pallet
Dripperline100-L1	9310	Ø ca. 16 mm	100 m²-roll	24 rolls

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet PV	2131	ca. 2.00 m × 50.00 m	100 m²-roll	900 m²



	Art.-No.	Dimensions
Irrigation-Manager BM 4	4045	L × W × H : ca. 480 × 480 × 300 mm

If the waterproofing is not root resistant, the Root Barrier WSB 100-PO is required as a bottom layer of the System Build-up.

System Build-up "Urban Rooftop Farming"

The number of densely-populated urban centres is steadily rising. As more than half of the global population now lives in towns or cities, the demand for residential zones and infrastructure in urban areas is naturally also on the increase. Undeveloped land and green areas are becoming increasingly rare, resulting in the loss of agricultural land.

In order to counter this development from an urban development and climatic point of view, green roofs have become popular in densely-populated areas.

It makes absolute sense, therefore, to use these roof areas for growing vegetables, fruit and herbs as the benefits are considerable both in terms of the environment and economics. For example, given the vicinity to the consumer, supply routes and emissions are minimized. Short supply routes mean that the produce is fresher and as a result tastier.

Circular techniques that integrate urban vegetable production are also profitable, given that urban farming on roof areas uses local resources: rainwater and filtered waste water, solar energy and the heat from the building. On the other hand, a vegetable garden will serve the building well as the plants provide cooling in the summer and thermal protection in the winter. This is good for the building climate and just as beneficial for the roof waterproofing membrane because it is no longer exposed to extreme fluctuations in temperature. In addition, plants help to improve the urban climate.

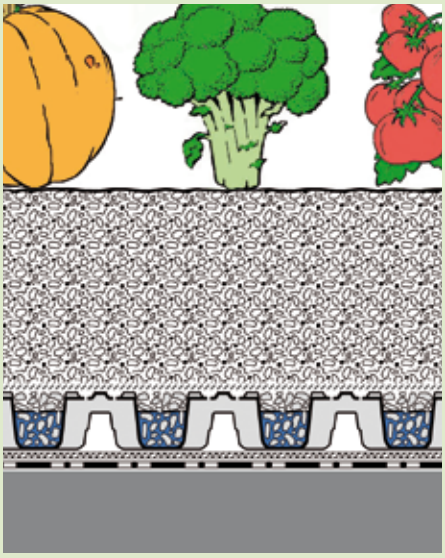
There are basically two types of urban farming, private and commercial. The latter is carried out on roofs either in the open-air or under glass.

The specific requirements of a roof-top location (e.g. wind, structural requirements, water run-off and above all the issue of safety) must be addressed at the planning stage.

System Build-up
„Urban Rooftop Farming"

Features:

- With 200 mm ZinCo System Substrate, this build-up is suitable for fruit and vegetables such as lettuce, onions, zucchini, eggplant, squash, cabbage, melons, strawberries, herbs and such like.
- For vegetables and fruits e.g. tomatoes, green beans, raspberries, blackberries, currants and such like a substrate depth of 280 to 400 mm is recommended.
- The amount of fertilizer and irrigation depends on the requirements of the cultivated fruit and vegetable species and on local climate conditions.



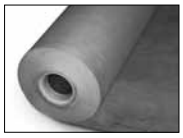
Fruits and vegetables

System Substrate "Lawn", 200–400 mm

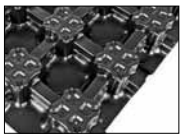
Filter Sheet TG
Floradrain® FD 60 neo
Protection Mat ISM 50
Root Barrier WSB 100-PO,
if waterproofing is not root-resistant

Suitable plants for the System Build-up "Urban Rooftop Farming" are available at garden centres or plant nurseries.

	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Lawn"	big bag	615101	bulk	615201



	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet TG	2192	ca. 2.00 m × 100.00 m	200 m^2-roll	1800 m^2
	2193	ca. 1.00 m × 100.00 m	100 m^2-roll	900 m^2



	Art.-No.	Dimensions	Unit	Pallet
Floradrain® FD 60 neo	3062	2.30 m × 1.03 m aprox. (neto 2.25 × 1.00 m)	Platte à 2.30 m^2	450 m^2

	Art.-No.	Dimensions	Unit
Protection Mat ISM 50	2050	ca. 2.00 m × 25.00 m	50 m^2-roll

If the waterproofing is not root resistant, the Root Barrier WSB 100-PO is required as a bottom layer of the System Build-up.

System Build-up "SolarVert®"

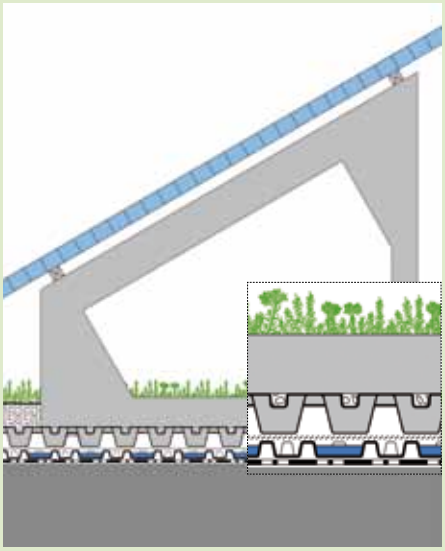
Green Roofs include a range of benefits. They can add thermal insulation, protect the waterproofing, improve biodiversity, retain storm water and improve the micro-climate. ZinCo extend the advantages of Green Roof technology with the development of support bases for solar panels. With the innovative Solar Base, solar energy can be integrated into Green Roof Systems without penetration of the roof membrane, the Green Roof build-up providing the necessary load to keep the structure in place. The Solar Base can be used for photovoltaic as well as for solar water heating applications. The inclusion of solar power can be seen as another valuable ecological benefit and will contribute towards compliance with various building regulations, environmental standards and assessments. Furthermore, this system makes use of synergy effect, as the efficiency of solar panels is significantly improved if combined with a Green Roof.

The System Build-up "SolarVert®" as illustrated above has been designed for the classical southern exposure with a maximal energy yield during the midday period.
Meanwhile there is an increasing demand for systems with an east-west orientation aiming at a more evenly distributed yield during the day and avoiding excessive power peaks.
See example on the left: Weilheim public utility, Germany. These systems can also be realised with the ZinCo Solar Base SB 200 and a base frame with an inclination of approx. 15°.

System Build-up
"SolarVert®"

Features:

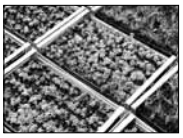
- No penetration of the waterproofing.
- Even load distribution, no high point loads.
- No transport of heavy parts on the roof.
- Continous drainage.
- The required substrate quantity depends on the project-specific analysis.



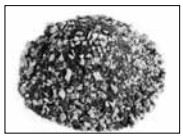
Solar Panel

Solar Base Frame SGR 25/30/45

Plug Plants FB 50 "Sedum Carpet" or
Sedum Cuttings,if available
System Substrate "Sedum Carpet"
ZinCo Solar Base SB 200
Fixodrain® XD20
Root Barrier WSF 40 and Filter Sheet PV,
if waterproofing is not root-resistant

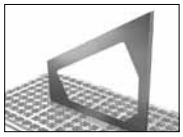


	Art.-No.	Unit
Sedum Cuttings	8020	bag of 2 kg
Plug Plants FB 50 "Sedum Carpet"	8110	tray with 50 pcs.

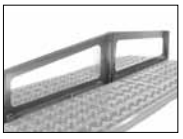


	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Sedum Carpet"	big bag	611101	bulk	611201	silo	611301

	Art.-No.	Dimensions	Unit
Solar Base SB 200	3460	ca. 1.00 m × 2.00 m	piece
Solar Base SB 200-Q crosswise installation	3463	ca. 1.00 m × 2.00 m	piece
Solar Base SB 200-4 for east-west-installation	3465	ca. 1.00 m × 2.00 m	piece



	Art.-No.	Length	Front Heigth	Rear Height	Unit
Solar Base Frame SGR with different inclinations	9700...	950 mm	350 mm	430–1300mm	piece



	Art.-No.	Unit
Solar Substructure East-West Set of Screws	9133	Pack

	Art.-No.	Unit
Wind Bracing – Stabilisation of two Solar Base Frames in different sizes	9710...	piece

	Art.-No.	Dimensions	Unit
Fixodrain® XD 20	3021	ca. 1.00 m × 20.00 m	20 m^2-roll

If the waterproofing is not root resistant, the Root Barrier WSF 40 is required as a bottom layer of the System Build-up.

Green Roofs, Safety and Guardrails

Working on a roof always involves risks, no matter whether it's inspecting technical equipment, upkeeping gravel roofs or maintaining Green Roofs.
Accident prevention saves lives! Therefore, regulations prescribe safety measures for work that is being carried out on roofs with a low parapet.

ZinCo offers a maximum of safety to people and buildings through their innovative Fallnet® solutions specifically designed for the use on Green Roofs.

There are various types of Fallnet® Fixing Devices, all of them non-penetrating and based on the idea of using the actual Green Roof build-up as necessary ballast. For instance, the Fallnet® SR Fixing Device consists of interlocking grid elements and a centralised fixing point made of stainless steel. It offers new dimensions in terms of flexibility and can be adapted to nearly any construction requirement and geometry. Light domes, drainage outlets and roof penetrations can be smartly embedded within the Fallnet® SR.
The grid system is simply laid over the drainage layer and is held in place by the weight of the substrate layer.
All Fallnet® systems offer attractive solutions for providing anchorage points for safety harnesses, without penetrating the waterproofing membrane. Whatever the substructure, their installation is possible on most flat roofs with slopes up to 5°, provided the load bearing capacity allows for the minimum required ballast (up to 130 kg/m² dry weight).
They can be supplemented by personal protective equipments (ZinCo PPE-Set), as well as ZinCo Guardrail Systems.

Every Fallnet® SR is delivered with an identification label securely attached at the anchor eye. On this label you will find information about the product type, standard testing method, date of manufacture and serial number. If required, this information allows to document, even after decades, the contractor and the planning for this protect.

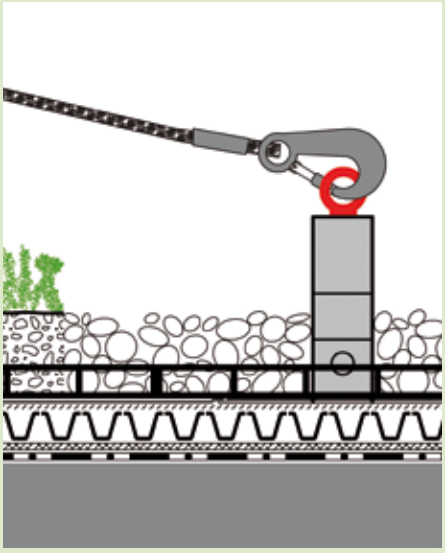
The horizontally installed rail allows for the use of the whole radius surrounding the gliding runner, which is an ideal and efficient application on narrow roofs.

ZinCo Railing Solutions – attractive, functional and installed on the roof without penetration of the waterproofing.

Green Roofs with "Fallnet® "

Features:

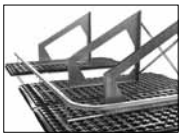
- No roof penetration.
- Quick and easy installation, no specific tools required.
- Suitable for all roofs with load-bearing capacity.
- Independant of the substructure.
- Neutral with regards to building physics (thermal bridges).
- No visual nuisance.
- Certified according to European Standard EN 795:2012, Typ E.



Fallnet® SR Anchorage point

Grid with Fallnet® base plate
Filter Sheet
Floradrain® FD 25-E
Protection Mat SSM 45
Root Barrier WSF 40, if waterproofing is not root-resistant

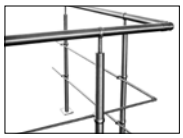
Fallnet® SR — Fixing Device, consisting of single grid elements which are plugged together to one unit and to be covered with min. 90 kg/m^2 superimposed load.



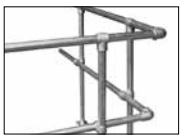
Fallnet® SB 200-Rail — Fixing Device to be installed in combination with the Solar Base SB 200 or the Guardrail Base GB. Installed without any roof penetration using superimposed load.

Fallnet® SR Rail — Fixing Device, consisting of grid elements which are plugged together to one unit with a centrally placed rail support. Modular expandable horizontal rail solution with a permanent sliding runner.

Fallnet® PPE-Set — Personal proctective equipment according to European Standard EN 363 for work on roofs, compatible with the ZinCo Fixing Device Fallnet®. It consists of a safety harness, connectors, rope, rope shortener, shock absorber and instruction manual stored in a stable sheet metal case.



Railing System SG 40-E — Elegant shaped railing, made of stainless steel, adapted to the Guardrail Base GB, for installation without any roof penetration and drilling.
For project specific solutions please contact us for further informations.



Railing System SG 40-S — Functional and stable railing, made of galvanized steel, adapted to the Guardrail Base GB, for installation without any roof penetration and drilling.
For project specific solutions please contact us for further informations.

System Build-up “Walkways & Driveways”

Rooftops are being used holistically at an ever increasing rate. Nearly everything that can be realised on the ground is now possible on roofs too, provided the right technology is used.
For instance, long lasting and functioning walkways and driveways on rooftops require well-engineered systems.
These assure the continuance of the roof function (e.g. continuous waterproofing and drainage capacity) and allow for horizontal forces generated by accelerating, braking and steering.

If walkways and driveways are combined with Green Roofs, not only drainage and compressive strength are important, but also the water retention capacity. Stabilodrain® SD 30, the core piece of this build-up, meets all requirements and ensures durable functionality.

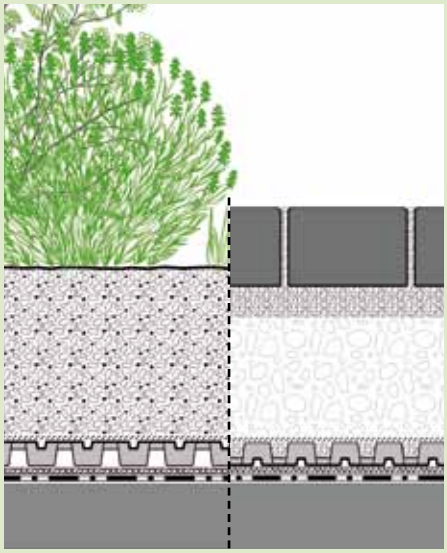
Stabilodrain® SD 30 is an extremely stable, high pressure resistant drainage element that is quick and easy to install with its lateral, specially shaped connecting profiles. Depending on the installation, it allows for drainage of water (diffusion holes facing downwards) or for drainage combined with water retention (diffusion holes facing upwards).

Stabilodrain® SD 30 can also be installed on inverted roofs, where it is essential to avoid creating a vapour barrier above the XPS insulation material.

System Build-up
"Walkways and Driveways"

Features:

- Heavy duty Hybrid Solution with high pressure resistance.
- Suitable for walkways, driveways, lawn and shrubs, bushes, small trees etc..
- Perfect for low connection heights.
- Trafficable with wheel loaders, also without infill.
- Suitable on flat roofs with standing water and on inverted roofs.

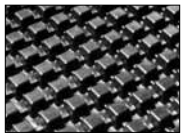


Concrete or natural stone pavers

30–50 mm bedding layer
Gravel base layer (only for driveways)
Filter Sheet PV
Stabilodrain® SD 30 with infill
Protection Mat ISM 50
Root Barrier WSB 100-PO,
if waterproofing is not root-resistant

Concrete or natural stone pavers are chosen according to the anticipated load demand and should meet the requirements of relevant standards. A greater paver depth results in a greater support surface and in a reduction of a possible distorsion of the bedding material underneath. With driveways on roofs, it is therefore crucial to plan sufficient load distribution, either through the paving surface or through an adequate base layer. Materials for base layers should ensure excellent compactibility and stability.
Bedding material can come in different grain sizes, but has to harmonise with the joint material to prevent it from being washed out. The ZinCo Technical Department provides assistance with designing the appropriate build-up. Please contact us for more information.

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet PV	2131	ca. 2.00 m × 50.00 m	100 m^2-roll	900 m^2



	Art.No.	Dimensions	Unit	Pallet
Stabilodrain® SD 30	3330	ca. 0.94 m × 2.00 m	1.88 m^2 board	150 boards

	Art.-No.	Dimensions	Unit
Protection Mat ISM 50	2050	ca. 2.00 m 25.00 m	50 m^2-roll

If the walkway or driveway is to be combined with a vegetated green roof area on top of a non root resistant waterproofing, the Root Barrier WSB 100-PO is additionally required.

System Build-up "Driveways"

Driveways on roofs require both a load-bearing System Build-up and an adequate strength in roof construction. Moreover, vehicular traffic on a roof deck induces very significant horizontal forces and torsional movements through steering, breaking and accelerating, that must be absorbed.

The System Build-up for cars employs the extremely stable Elastodrain® EL 202 specifically designed for low applications, without base layer.

The Elastodrain® EL 202 has a very high compressive strength and distributes the load evenly into the substructure. This system is designed for heavy loads. A precondition is that the slope of the future driveway surface is taken into account in the planning. Establishing a slope is not a problem, if the waterproofing and surface have the same slope. If the slope on the surface has to be different from the slope of the waterproofing, a gravel base layer is necessary. The slope cannot be created with the bedding layer, as it will result in uneven settlement. For applications with gravel base layer the drainage element Protectodrain® PD 250 ist the perfect solution. Moreover, the pavement thickness must be suitable for this application.

Occasionally, roofs and their surfaces have to bear exceptionally heavy loads, e.g. in case of delivery or fire brigade access.

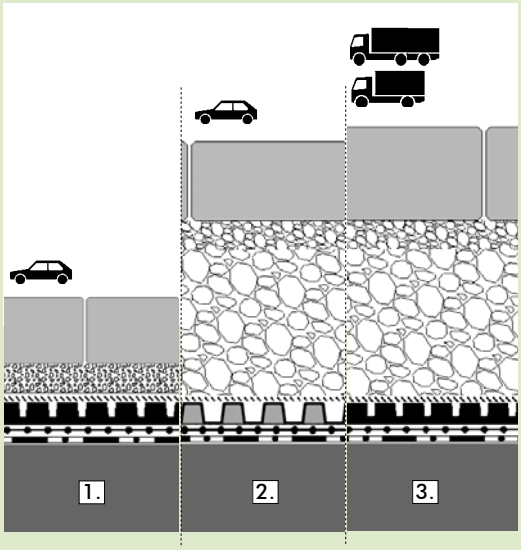
The thickness of the pavers or concrete slabs must enable a horizontal absorbtion of forces. For wheel loads exceeding 1 ton, a load distributing base layer has to be designed. Extreme stresses require extremely good protection layers in order to protect the waterproofing. Here again the Elastodrain® EL 202 with its high compressive and tensile strength is the perfect drainage element.

In addition two layers of Slip Sheet keep the horizontal forces issued by steering, breaking and accelerating away from the waterproofing level. The edge trim is very important too, as it contributes to the stability of the pavement. Its waterproofing must be sufficiently protected, too.

System Build-up "Driveways"

Features:

- A solid base for creative surface designs. Mainly for use under driveways, fire brigade access or parking areas.
- Elastodrain® / Protectodrain® protect the waterproofing during construction works from mechanical damages.
- After installation, Elastodrain® / Protectodrain® form a durable base for all types of roof landscapes.
- Elastodrain® / Protectodrain® ensure long lasting drainage, hence it prevents frost damages.



1. Concrete or natural stone pavers
bedding layer
Filter Sheet TG
Elastodrain® EL 202
Slip Sheet TGF 20 (2 layers)

2. Concrete or natural stone pavers
bedding layer
gravel base layer
Filter Sheet PV
Protectodrain® PD 250
Slip Sheet TGF 20 (2 layers)

3. Concrete or natural stone pavers
bedding layer
gravel base layer
Filter Sheet PV
Elastodrain® EL 202
Slip Sheet TGF 20 (2 layers)

For recomodations of bedding layers please contact us.

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet TG	2192	ca. 2.00 m × 100.00 m	200 m² -roll	1800 m²
	2193	ca. 1.00 m × 100.00 m	100 m²-roll	900 m²

	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet PV	2131	ca. 2.00 m × 50.00 m	100 m²-roll	900 m²

	Art.-No.	Dimensions	Unit	Pallet
Elastodrain® EL 202	3220	ca. 1.00 m × 1.00 m	1 m² board	50 boards
EL 202 Connector 2-holes	3221		bag 100 pieces	

	Art.-No.	Dimensions	Unit	Pallet
Protectodrain® PD 250	3250	ca. 1.00 m × 2.00 m	2 m² board	75 boards
PD 250-Connector	3251		Carton à 200 pieces	

	Art.-No.	Dimensions	Unit	Pallet
Slip Sheet TGF 20	1020	ca. 8.00 m × 25.00 m	200 m² -roll	6600 m²
	1022	ca. 3.00 m × 33.50 m	100.5 m² -roll	2211 m²

What ZinCo can do for you

ZinCo provide a comprehensive package of environmentally sound Green Roof Systems and customized project support, based on:

- 35+ years of experience in Green Roofs
- Tested & proven Green Roof Systems
- Exceeding quality standards & permanent innovation through research and development
- Compliance with relevant international standards
- Experts in structural engineering, landscape architecture, horticulture, material and soil science, …
- Support from planning to completion (design, specifications, CAD, consultancy, on-site)
- An international network of partners
- Comprehensive warranties

To date, ZinCo Green Roof solutions have inspired planners and contractors throughout the world, providing them with the necessary flexibility to accommodate a wide range of designs and building needs.

Tell us about your project!
We've got the expertise to bring it to life.

Deutsches Institut für Bautechnik DIBt
European Technical Assessment
"Kits for Green Roofs"
CE ETA-13/0668

System Build-ups with European Technical Assessment
www.zinco-greenroof.com/european-technical-assessment

ZinCo

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