



PLANNING GUIDE

System Solutions for Thriving Green Roofs

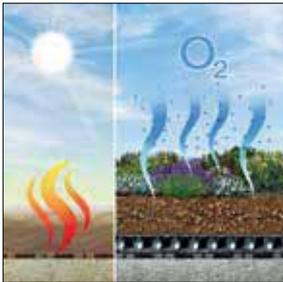
Life on Roofs



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



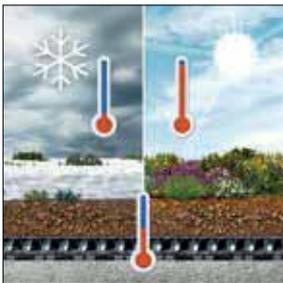
A Green Roof can reduce water run-off by 50–90%; any water flows from the roof with a delay. Outlets, pipes and drains can be reduced in capacity, thereby saving construction costs. Sewer costs can be reduced in some areas.

Improve Noise Protection



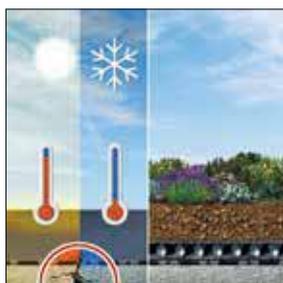
Planted areas are natural sound insulators and absorb more sound than hard surfaces. Green Roofs reduce reflective sound by up to 3 dB and improve sound insulation by up to 8 dB. This is very effective for buildings near airports, noisy nightclubs and factories.

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

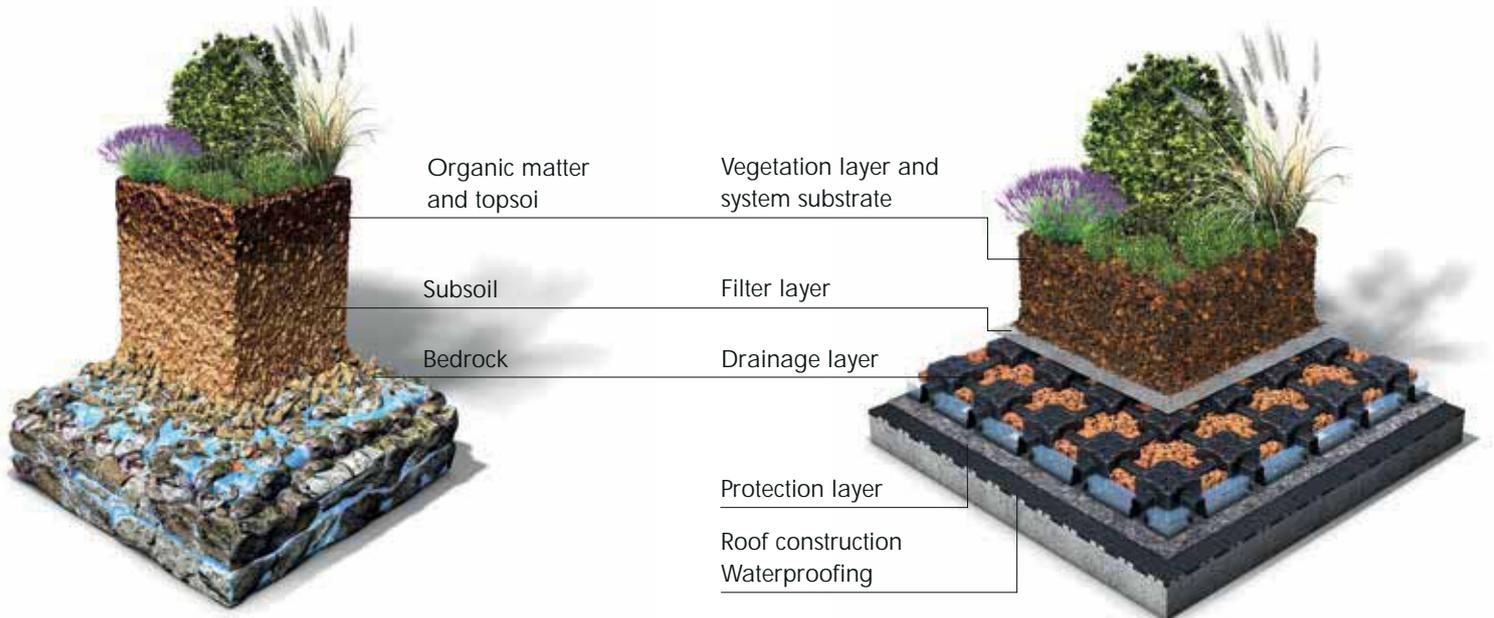


Intensive Green Roof

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



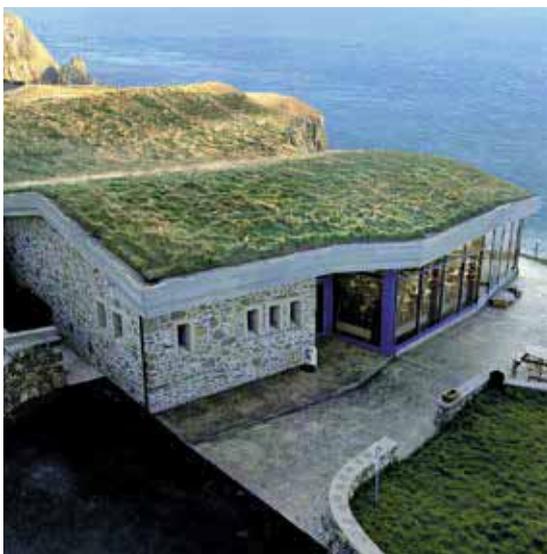
The Challenge

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

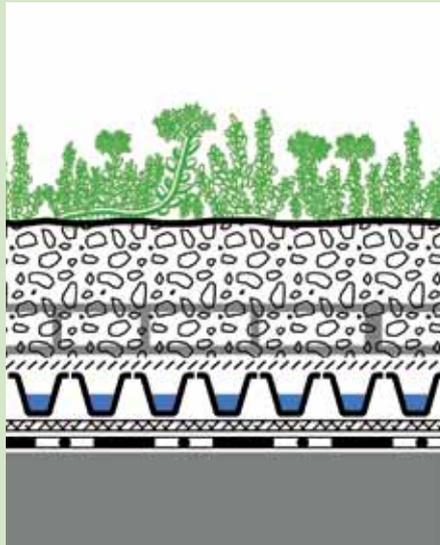
in autumn and are a nice change in the Green Roof's appearance. Sedum cuttings can be a cost-effective to vegetate a roof if this option ist locally available.



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.



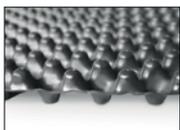
	Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
System Substrate "Sedum Carpet"	big bag	611101	bulk	611201	silo	611301



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 m ² -roll	4600 m ²
	2102	ca. 1.00 m × 100.00 m	100 m ² -roll	2500 m ²
	2101	ca. 2.00 m × 10.00 m	20 m ²	



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



	Art.-No.	Dimensions	Unit
Protection Mat SSM 45	2045	ca. 2.00 m × 50.00 m	100 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.
If the System Build-up is to be in compliance with the ETA standard, the Root barrier WSB 100-PO must be used instead.



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



System Build-up with EPD verification.
Details can be found here: <https://zinco-greenroof.com/epd>

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 continuous 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 “Bee Pasture”

As a result of strongly industrialised farming methods, an alarming reduction in the number of honey bees and wild bees has become evident.

However, with this special plant community which focuses on a long-lasting supply of nectar and pollen, bees will have a blossoming “landing zone” from April through to September.

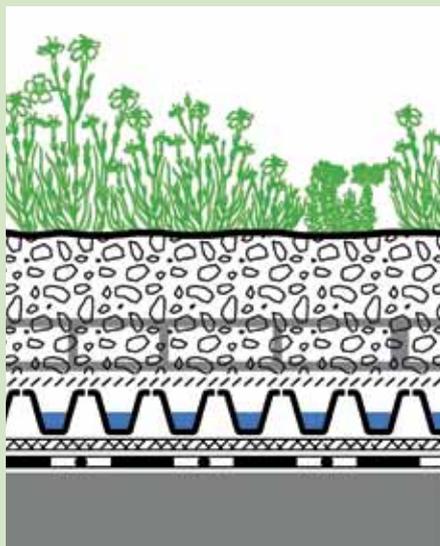
The system build-up Bee Pasture is one module in the bio-diversity roof and can be supplemented with dead wood, sand pockets, nest aids, etc.

For further information, see:
<https://zinco-greenroof.com/bee-pasture>

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"

Fallnet®

Filter Sheet SF

Floradrain® FD 25-E

Protection Mat SSM 45

Root Barrier, if waterproofing is not root-resistant



Plug Plants FB 50
"Rockery Type Plants"

Art.-No.	Unit
8120	tray with 50 pieces



System Substrate
"Rockery Type Plants"

Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
big bag	612101	bulk	612201	silos	612301

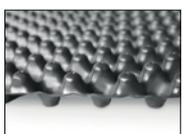


This System Build-up allows the integration of the Fallnet® Fixing Device for roofs with slopes up to 5° (see page 34–35)



Filter Sheet SF

Art.-No.	Dimensions	Unit	Pallet
2100	ca. 2.00 m × 100.00 m	200 m ² -roll	4600 m ²
2102	ca. 1.00 m × 100.00 m	100 m ² -roll	2500 m ²
2101	ca. 2.00 m × 10.00 m	20 m ²	



Floradrain® FD 25-E
Floradrain® FD 25-R (Roll)
Floradrain® FD 25-RV
(Roll & Filter Sheet)

Art.-No.	Dimensions	Unit	Pallet
3028	ca. 1.00 m × 2.00 m	2 m ² -board	300 boards
3023	ca. 1.00 m × 15.00 m	15 m ² -roll	
3022	ca. 1.00 m × 15.00 m	15 m ² -roll	



Protection Mat SSM 45

Art.-No.	Dimensions	Unit
2045	ca. 2.00 m × 50.00 m	100 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.

If the System Build-up is to be in compliance with the ETA standard, the Root barrier WSB 100-PO must be used instead.



System Build-ups with European Technical Assessment.

Details can be found here: www.zinco-greenroof.com/european-technical-assessment



System Build-up with EPD verification.

Details can be found here: <https://zinco-greenroof.com/epd>

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.

For this reason, irrigation of green roofs that are rich in species is unavoidable in many regions. The build-up presented here will enable you to manage the balancing act between an inexpensive solution and the permanent proper functioning of your green roof. As is the

case with the Urban Climate Roof, irrigation is also beneath the substrate in this case. The water is therefore available exactly where the plant needs it.

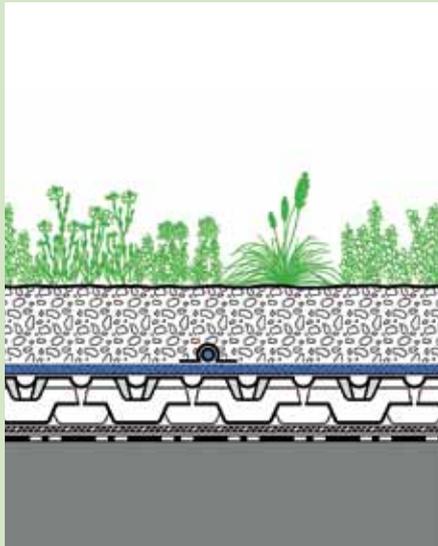
Unlike the Urban Climate Roof build-up, however, the plants will only be provided with the amount of water they need for healthy growth. A shallower substrate means not only that the roof build-up is lighter in weight but also that other plant communities can be used.



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 100 mm

Dripperline 500-L2
Aquafleece AF 300
e. g. Floraset® FS 50
Protection Mat TSM 32
Root Barrier, if waterproofing
is not root-resistant

	Plug Plants FB 50 "Rockery Type Plants"	Art.-No. 8120	Unit tray with 50 pieces				
	System Substrate "Rockery Type Plants"	Unit big bag	Art.-No. 612101	Unit bulk	Art.-No. 612201	Unit silo	Art.-No. 612301
	Dripperline 500-L2	Art.-No. 935000	Dimensions Ø ca. 16 mm	Unit roll à 100 m			Pallet 24 rolls
	Aquafleece AF 300	Art.-No. 2120	Dimensions ca. 2,00 m × 50,00 m	Unit roll 105 m ² roll			
	Floraset® FS 50	Art.-No. 3052	Dimensions ca. 1,00 m × 1,00 m	Unit board à 1 m ²			Pallet 64 m ²
	Protection Mat TSM 32	Art.-No. 2032	Dimensions ca. 2,00 m × 50,00 m	Unit roll à 100 m ²			Pallet 800 m ²

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.

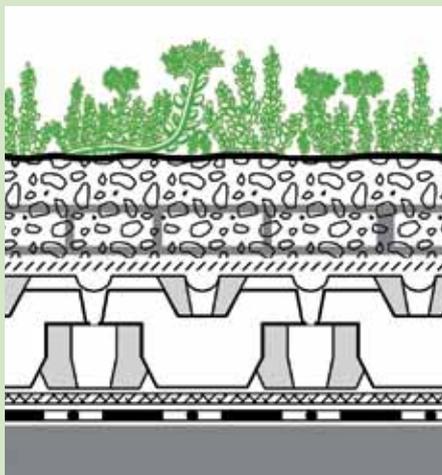
System Build-ups for extensive Green Roofs are to be adapted to these requirements. By using Floraset®, a deeper drainage element (50 or 75 mm), the necessary distance between the water level and the vegetation layer is ensured. The System Build-up is higher compared to a standard build-up, but has a 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"
from 70 mm

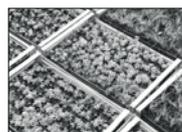
Fallnet®
Filter Sheet SF

Floraset® FS 50 (FS 75)

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



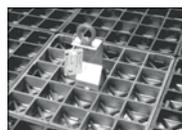
	Art.-No.	Unit
Seed Mixture "Meadow Scents"	8003	bag of 0.5 kg
	8004	bag of 1.0 kg
	8005	bag of 2.0 kg
	8006	bag of 5.0 kg



	Art.-No.	Unit
Sedum Cuttings Plug Plants FB 50 "Sedum Carpet"	8020	bag of 2 kg
	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 m ² -roll	4600 m ²
	2102	ca. 1.00 m × 100.00 m	100 m ² -roll	2500 m ²
	2101	ca. 2.00 m × 10.00 m	20 m ²	



	Art.-No.	Dimensions	Unit	Pallet
Floraset® FS 50 Floraset® FS 75	3052	ca. 1.00 m × 1.00 m	1 m ² -board	54 boards
	3076	ca. 1.00 m × 1.00 m	1 m ² -board	40 boards



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



System Build-up with EPD verification.
Details can be found here:
<https://zinco-greenroof.com/epd>

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

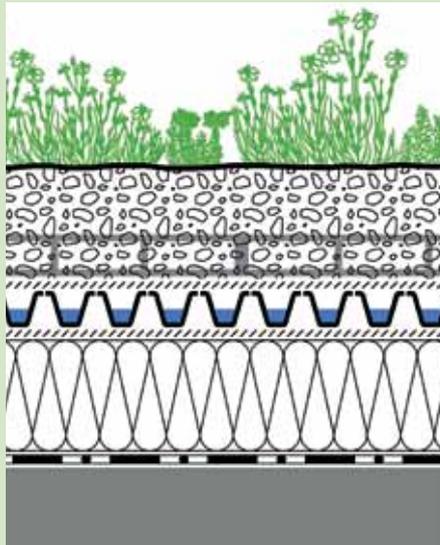
below the insulation directly onto the waterproofing. A deeper substrate layer compensates for the water retention capacity of the missing protection mat and prevents wind uplift of the insulation boards.



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



Plug Plants FB 50 "Rockery Type Plants"	Art.-No. 8120	Unit tray with 50 pcs.
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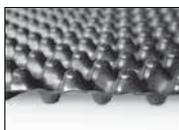
System Substrate "Rockery Type Plants"	Unit big bag	Art.-No. 612101	Unit bulk	Art.-No. 612201	Unit silo	Art.-No. 612301
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This System Build-up allows the integration of the Fallnet® Fixing Device for roofs with slopes up to 5° (see page 34–35)



	Art.-No.	Dimensions	Unit	Pallet
Filter Sheet SF	2100	ca. 2.00 m × 100.00 m	200 m ² -roll	4600 m ²
	2102	ca. 1.00 m × 100.00 m	100 m ² -roll	2500 m ²
	2101	ca. 2.00 m × 10.00 m	20 m ²	



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



	Art.-No.	Dimensions	Unit	Pallet
Separation Membrane TGV 21	2180	ca. 1.60 m × 250.00 m	400 m ² -roll	3600 m ²
	2185	ca. 1.60 m × 50.00 m	80 m ² -roll	1600 m ²

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.



System Build-ups with European Technical Assessment.

Details can be found here: www.zinco-greenroof.com/european-technical-assessment

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 transferred 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

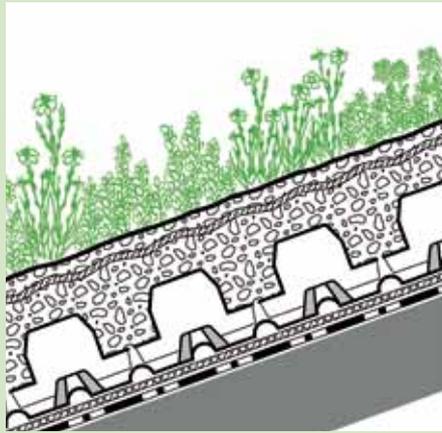


System Build-up with EPD verification.
Details can be found here:
<https://zinco-greenroof.com/epd>

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

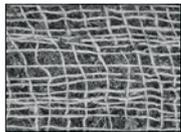
Jute Anti-Erosion Net JEG (> 15° slope)
System Substrate "Rockery Type Plants"
Floraset® FS 75
Protection Mat BSM 64
Root Barrier, if waterproofing is not root-resistant



Plug Plants FB 50 "Pitched Roof"
(ca. 10°-20°)

Art.-No.
8121

Unit
tray with 50 pieces



Jute Anti-Erosion Net JEG

Art.-No.
2856

Dimensions
ca. 70.00 m × 1.22 m

Unit
85.4 m²-bale

Pallet
683.2 m²



System Substrate
"Rockery Type Plants"

Unit
big bag

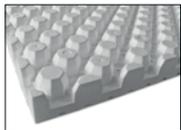
Art.-No.
612101

Unit
bulk

Art.-No.
612201

Unit
silo

Art.-No.
612301



Floraset® FS 75

Art.-No.
3076

Dimensions
ca. 1.00 m × 1.00 m

Unit
1 m²-board

Pallet
40 boards



Protection Mat BSM 64

Art.-No.
2064

Dimensions
ca. 2.00 m × 25.00 m

Unit
50 m²-roll



Shear Fix LF 150

Art.-No.
956705

Unit
carton



Shear Fix LF 300

Art.-No.
9568

Unit
piece



Shear Fix LF 600

Art.-No.
9569

Unit
piece



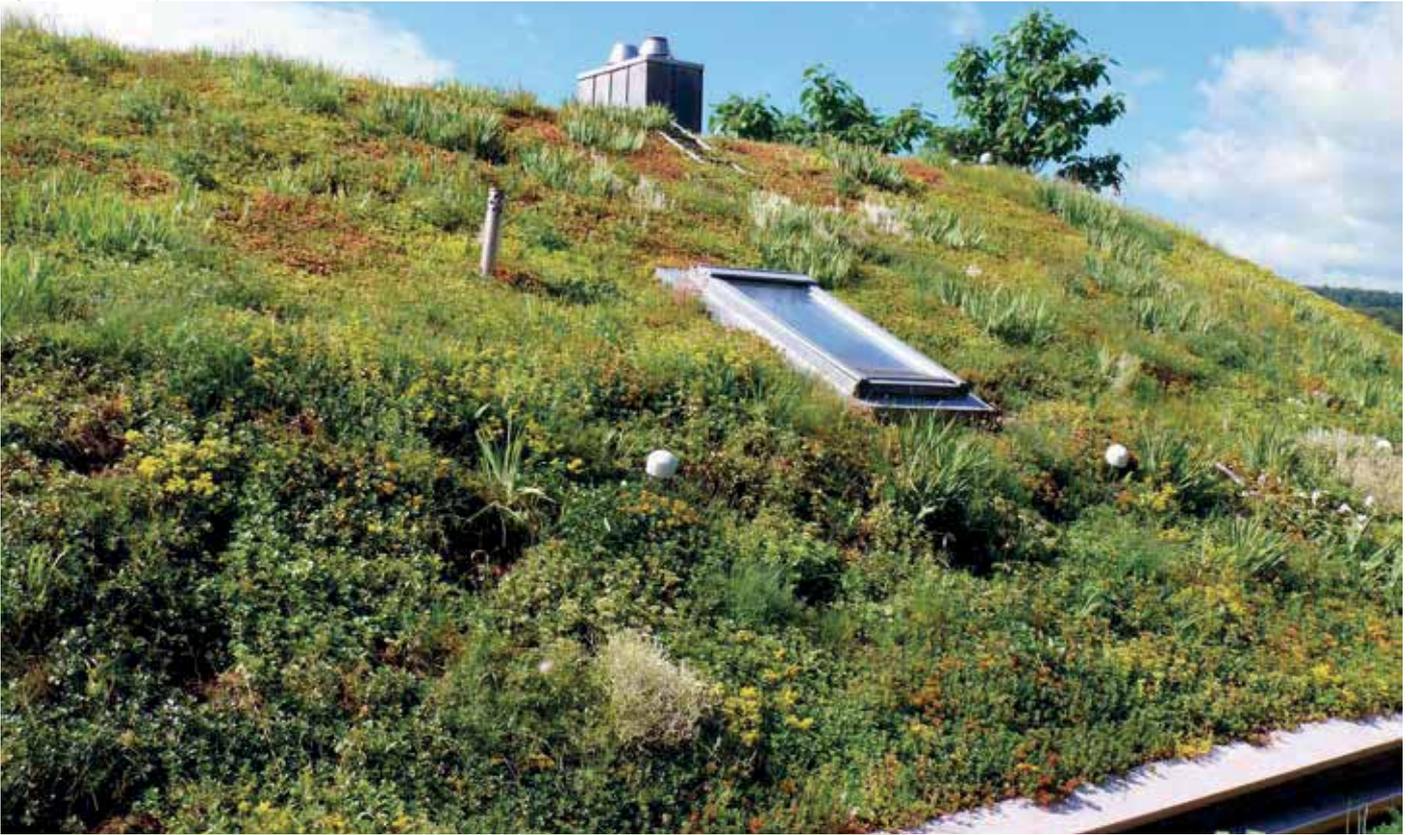
Eaves Profile TRP 140

Art.-No.
7782

Dimensions
length 3 m,
height 140 mm

Unit
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.

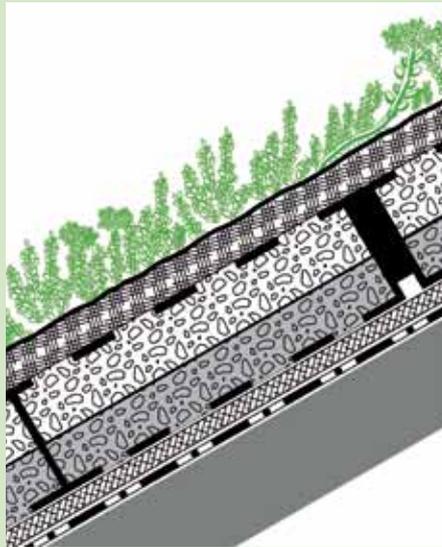
Georaster® elements can also be installed under reinforced lawns, footway constructions, in slope protection, etc.



System Build-up "Steep Pitched Green Roof"

Features:

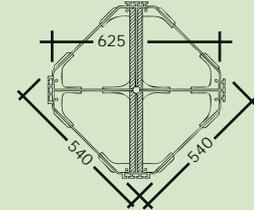
- Attractive pitched Green Roofs for root-proof and waterproofed roofs with slopes between 20° and 35°.
- Georaster® elements transfer the shear forces into the eaves or into additional shear barriers. (e. g. Shear Fix LF 300)
- Pitched Green Roofs require periodic maintenance. Depending on the location,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



Vegetation Mat "Sedum Carpet" $\geq 30^\circ$
or Plug Plants FB 50 "Steep Pitched
Green Roof" 32 pcs/m² $\leq 30^\circ$

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

Georaster®
Protection Mat WSM 150



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



System Substrate "Heather with Lavender-light"	Unit big bag	Art.-No. 614401	Unit bulk	Art.-No. 614501	Unit silo	Art.-No. 614601
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Georaster®	Art.-No. 3400	Dimensions ca. 0.54 m × 0.54 m	Unit piece	Pallet 96 pieces
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Protection Mat WSM 150	Art.-No. 2015	Dimensions ca. 1.00 m × 15.00 m	Unit 15 m ² -roll
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Eaves Profile TRP 140	Art.-No. 7782	Dimensions length 3 m, height 140 mm	Unit piece
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Support Bracket TSH 100	Art.-No. 9565	Unit piece
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Shear Fix LF 300	Art.-No. 9568	Unit piece
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Shear Fix LF 600	Art.-No. 9569	Unit piece
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Biodiversity Green Roof



In areas where nature has been destroyed by construction works and the ground is sealed, green roofs can partially compensate for lost green areas and can provide replacement habitats for flora and fauna. Above all, natural, low-maintenance extensive green roofs are important refuges for flora and fauna. Wild bees, butterflies and ground beetles find food and shelter there.

However, the development of biodiversity depends to a great extent on how the habitats that are provided for the flora and fauna on a roof are structured. Pure sedum green roofs that are frequently installed in conjunction with very shallow substrate depths are not suitable for exploiting this potential. Indeed, the biotope function of greened roof areas can be specifically fostered with very little

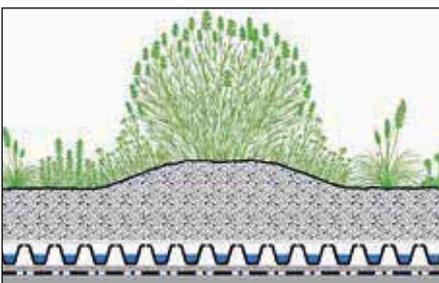
work using various design features and applying basic biodiversity principles during the planning and implementation stages.

Yet another type of biodiverse green roof involves vegetation that is native to the region. For example, with the right system build-up, calcareous grassland areas will find a well-functioning substitute habitat on rooftops.

The Biodiversity Modules

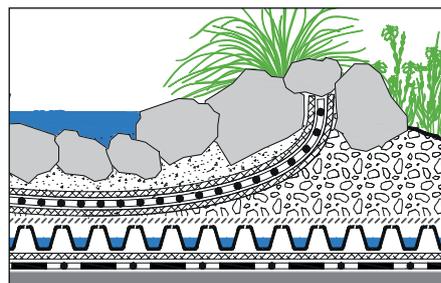
The number of biodiversity modules to be used can be freely chosen. This can be taken into consideration as early as the planning stage and individual modules can be fitted retrospectively.

Substrate Modulation and Enhancement of Vegetation



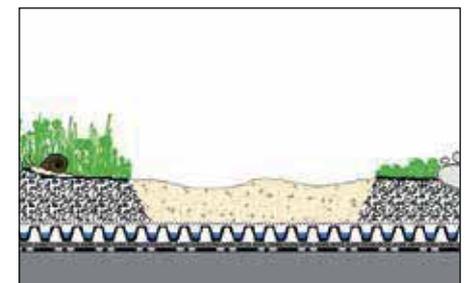
By modelling the substrate surface, the range of plant species can be extended considerably.

Temporary Water Bodies



Temporary water bodies serve as a bathing place or drinking trough for insects and birds.

Vegetation-free Areas e.g. Sand Pockets, gravel or crushed Stone

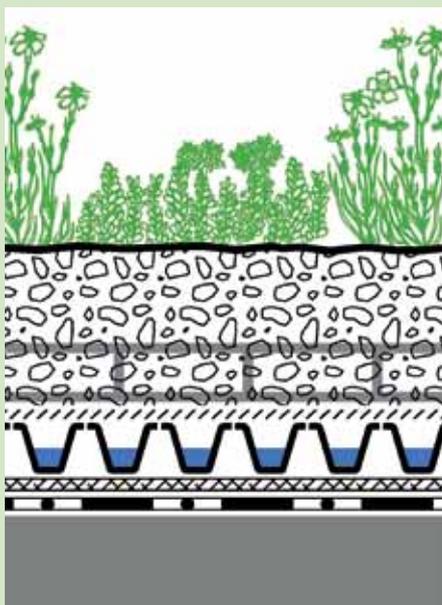


Insects and other species use vegetation-free areas (sand pockets and crushed stone) as breeding grounds, sunbathing areas or hiding places.

Biodiversity Green Roof

Features:

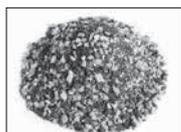
- The ZinCo system build-up for extensive green roofs provides the basis for a biodiverse green roof.
- The seed mixture Sedum Meadow Scent, for example, is suitable as a plant community as it provides a relatively broad range of species.
- An extensive green roof can become a biodiverse green roof by using different design features (biodiverse modules).



Plant level, e.g.
„Sedum Meadow Scent“

System Substrate
“Rockery Type Plants”

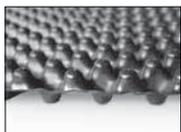
Fallnet®
Filter Sheet SF
Floradrain® FD 25-E
Protection Mat SSM 45
Root Barrier, if waterproofing
is not root-resistant*



System Substrate “Rockery Type Plants”	Unit big bag	Art.-No. 612101	Unit bulk	Art.-No. 612201	Unit silo	Art.-No. 612301
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Filter Sheet SF	Art.-No.	Dimensions	Unit	Pallet
	2100	ca. 2.00 m × 100.00 m	200 m ² -roll	4600 m ²
	2102	ca. 1.00 m × 100.00 m	100 m ² -roll	2500 m ²
2101	ca. 2.00 m × 10.00 m	20 m ²		



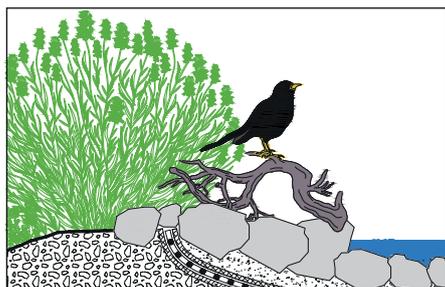
Floradrain® FD 25-E Floradrain® FD 25-R (Roll) Floradrain® FD 25-RV (Roll & Filter Sheet)	Art.-No.	Dimensions	Unit	Pallet
	3028	ca. 1.00 m × 2.00 m	2 m ² -board	300 boards
	3023	ca. 1.00 m × 15.00 m	15 m ² -roll	
3022	ca. 1.00 m × 15.00 m	15 m ² -roll		



Protection Mat SSM 45	Art.-No. 2045	Dimensions ca. 2.00 m × 50.00 m	Unit 100 m ² -roll
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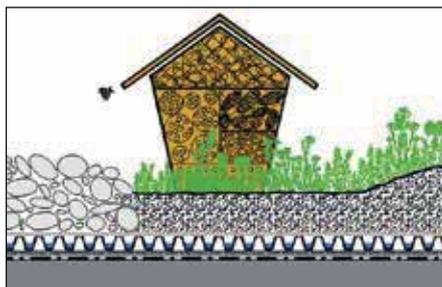
* If the waterproofing is not root resistant, the Root Barrier WSF 40 is required as a bottom layer of the System Build-up.

Deadwood



Deadwood is used as a habitat by moss, lichen, beetles, ants, wasps and solitary bees.

Nesting Aids



The use of nesting aids can support the permanent settlement of insects on roofs.

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.

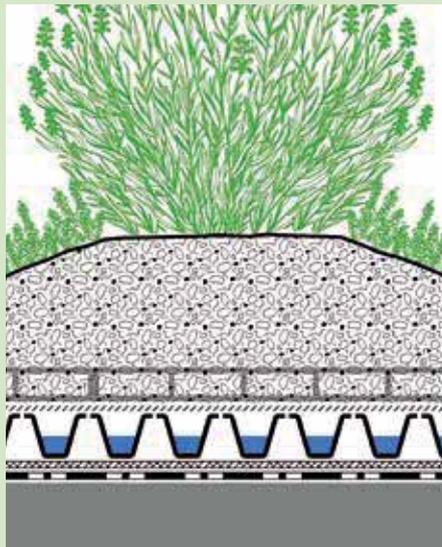
Floradrain® FD 40-E is a universal element for both extensive and intensive build-ups. It has a high drainage capacity and is also suitable for roofs without slope, provided residual ponding is less than 40 mm to keep the substrate clear of the water beneath. It is quick and easy to install as well as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

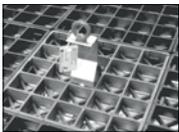
Fallnet®
Filter Sheet SF
Floradrain® FD 40-E
Protection Mat SSM 45
Root Barrier WSB 100-PO, if
waterproofing is not root-resistant

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



System Substrate
"Heather with Lavender"

Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
big bag	614101	bulk	614201	silos	614301



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



Filter Sheet SF

Art.-No.	Dimensions	Unit	Pallet
2100	ca. 2.00 m × 100.00 m	200 m ² -roll	4600 m ²
2102	ca. 1.00 m × 100.00 m	100 m ² -roll	2500 m ²
2101	ca. 2.00 m × 10.00 m	20 m ²	



Floradrain® FD 40-E
Floradrain® FD 40-RV
(Roll & Filter Sheet)

Art.-No.	Dimensions	Unit	Pallet
3041	ca. 0.96 m × 2.08 m	2 m ² -board	250 boards
3042	ca. 0.94 m × 10.70 m	10 m ² -roll	



Protection Mat SSM 45

Art.-No.	Dimensions	Unit
2045	ca. 2.00 m × 50.00 m	100 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-ups with European Technical Assessment.
Details can be found here: www.zinco-greenroof.com/european-technical-assessment



System Build-up with EPD verification.
Details can be found here: <https://zinco-greenroof.com/epd>

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 achieved by

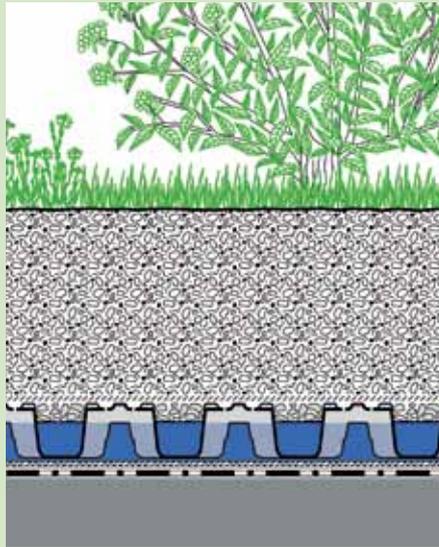
installing roof dam elements above the roof outlets. A roof laid at 0° fall is required to include this system, along with a suitable waterproofing membrane for such use. Inspection chambers make it possible to examine and maintain the roof dam elements at any time. With automatic irrigation, a minimum water storage can be maintained even in periods of drought.



System Build-up "Roof Garden"

Features:

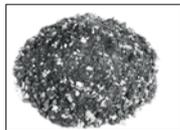
- Multifunctional Green Roof System Build-up with high water retention capacity and roof dam irrigation.
- Suitable for lawn and perennials; with a deeper substrate level also for bushes, small trees etc.
- Various combinations are possible, for example with walkways, patios, driveways or playgrounds.
- 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



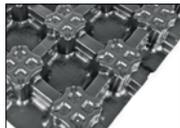
System Substrate "Roof Garden"	Unit	Art.-No.	Unit	Art.-No.
	big bag	616101	bulk	616201



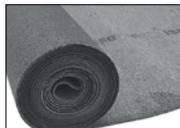
Filter Sheet SF	Art.-No.	Dimensions	Unit	Pallet
	2100	ca. 2.00 m × 100.00 m	200 m ² -roll	4600 m ²
	2102	ca. 1.00 m × 100.00 m	100 m ² -roll	2500 m ²
	2101	ca. 2.00 m × 10.00 m	20 m ²	



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



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



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



Root Barrier WSB 100-PO	Art.-No.	Dimensions	Unit	Pallet
	1084	ca. 2.44 m × 30.50 m	74.4 m ² -roll	1116 m ²



Dam-up element	Art.-No.	Unit
	4146	piece



System Build-ups with European Technical Assessment.

Details can be found here: www.zinco-greenroof.com/european-technical-assessment



System Build-up with EPD verification.

Details can be found here: <https://zinco-greenroof.com/epd>

System Build-up "Roof Garden" with Aquafleece Irrigation

Lightweight intensive green roof with patented underfloor irrigation.

This system build-up is used in case of a low load reserve and/or a low build-up height.

It has a build-up height of between 15 and 25 cm for lawns and perennials, and it is also suitable for shrubs where mounding (up to 40 cm) is used.

Applicable on 0°-roofs and on roofs with a slight inclination of up to ca. 8°.

Irrigation is carried out with special dripperlines. They are attached to the Aquafleece AF 300 with a hook & loop tape at intervals of 500 mm and fed with the required amount of water via an automatic irrigation control unit.

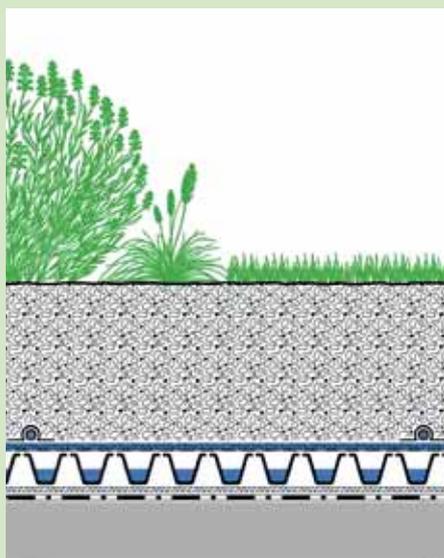
Due to the fact that Aquafleece AF 300 distributes the water evenly and supplies it to the plants from below, the water consumption is relatively low.



System Build-up "Roof Garden" with Aquafleece Irrigation

Features:

- This system build-up is used in case of a low load reserve and/or a low build-up height.
- Green system roof build-up for lawn, perennials and with mounds (up to 400 mm) also for shrubs.
- Applicable on 0°-roofs and on roofs with a slight inclination of up to ca. 8°.
- Irrigation is carried out with special dripperlines that are attached to the Aquafleece AF 300 with a hook & loop tape and fed with the required amount of water via an automatic irrigation control unit.



Lawn, perennials and small shrubs (over substrate mounds)

System Substrate "Heather with Lavender" or "Lawn", 150–250 mm
 Dripperline 500-L2
 Aquafleece AF 300
 Floradrain® FD 40-E
 Protection Mat ISM 50
 Root Barrier WSB 100-PO, if waterproofing is not root-resistant



System Substrate "Lawn"	Unit big bag	Art.-No. 615101	Unit lose	Art.-No. 615201
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System Substrate "Heather with Lavender"	Unit big bag	Art.-No. 614101	Unit lose	Art.-No. 614201	Unit im Silozug	Art.-No. 614301
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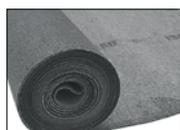
Aquafleece® AF 300	Art.-No. 2120	Dimensions ca. 2,10 m × 50,00 m	Unit Rolle à 105 m²
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Dripperline 500-L2	Art.-No. 935000	Dimensions Ø ca. 16 mm	Unit roll à 100 m	Pallet 24 rolls
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Floradrain® FD 40-E	Art.-No. 3041	Dimensions ca. 0.96 m × 2.08 m	Unit 2 m²-board	Pallet 250 boards
Floradrain® FD 40-RV (Roll & Filter Sheet)	Art.-No. 3042	Dimensions ca. 0.94 m × 10.70 m	Unit 10 m²-roll	



Protection Mat ISM 50	Art.-No. 2050	Dimensions ca. 2.00 m × 25.00 m	Unit 50 m²-roll
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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®” with East-West orientation

Systems with an East-West orientation provide for a balanced yield throughout the day and help to avoid excessive peak loads.

“Butterfly” Type

Modules in an East-West orientation can be assembled either as type “saddle” or type “butterfly”.

For a “Butterfly” type installation, the two Solar Base Frames are mounted onto the Solar Base SB 200-4 in a way that their lower ends meet in the middle. Rainwater is directed towards the centre of the Solar Base SB 200-4 and distributed from there in both directions.

The outer edge of the solar panels is at a maximum height of 700 mm from the substrate surface here, so that the area below the panels can be easily accessed for maintenance.



“Saddle” Type

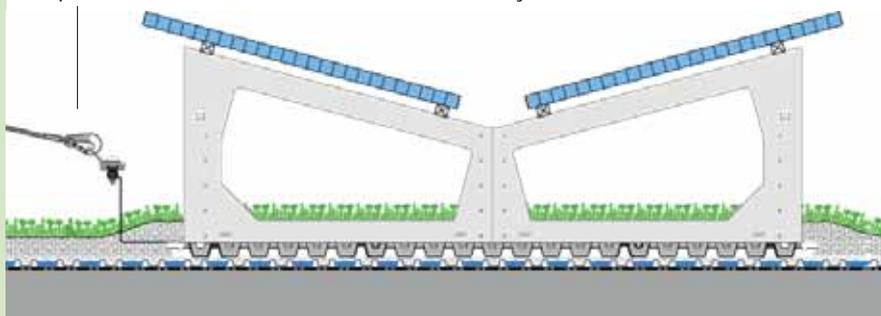
For a “Saddle” type installation, the two Solar Base Frames are mounted onto a Solar Base SB 200-4 in a way that their higher ends meet in the middle.

Between the lower edge of the solar panel and the substrate surface there is sufficient space for plants to grow below the panels. With the panels meeting with their higher edges in the middle, snow for example is diverted to the outside.



Solar Substructure Type "Butterfly"

Fall protection Fallnet® SB 200-Rail, if necessary



Solar Panel

Solar Base Frame

Sedum cuttings or plug plant according to plant list "Sedum Carpet"
System Substrate "Sedum Carpet"
Solar Base SB 200, with infill
Fixodrain® XD 20
Roof construction with root resistant waterproofing*

Solar Substructure Type "Saddle"

Fall protection Fallnet® SB 200-Rail, if necessary



Solar Panel

Solar Base Frame

Sedum cuttings or plug plant according to plant list "Sedum Carpet"
System Substrate "Sedum Carpet"
Solar Base SB 200, with infill
Fixodrain® XD 20
Roof construction with root resistant waterproofing*



Solar Mounting Profile SMP 38/33

Art.-No.

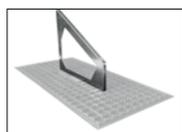
9730

Dimensions

L: ca. 6,00 m;
W x H: ca. 38 mm x 33 mm

Unit

piece



Solar Base Frame SGR

Art.-No.

970005

Inclination

5°

Length

ca. 950 mm

Front Height

ca. 350 mm

Rear Height

ca. 430 mm

970010

10°

ca. 950 mm

ca. 350 mm

ca. 520 mm

970015

15°

ca. 950 mm

ca. 350 mm

ca. 610 mm

970020

20°

ca. 950 mm

ca. 350 mm

ca. 700 mm

970025

25°

ca. 950 mm

ca. 350 mm

ca. 790 mm

970030

30°

ca. 950 mm

ca. 350 mm

ca. 900 mm

970035

35°

ca. 950 mm

ca. 350 mm

ca. 1020 mm

970040

40°

ca. 950 mm

ca. 350 mm

ca. 1150 mm

970045

45°

ca. 950 mm

ca. 350 mm

ca. 1300 mm



ZinCo Solar Base SB 200-4

Art.-No.

3465

Dimensions

ca. 1,00 m x 2,00 m

Unit

piece



Sedum Cuttings

Art.-No.

8020

Unit

bag of 2 kg

Plug Plants FB 50 "Sedum Carpet"

8110

tray with 50 pcs.



System Substrate "Sedum Carpet"

Unit

big bag

Art.-No.

611101

Unit

bulk

Art.-No.

611201

Unit

silo

Art.-No.

611301



Fixodrain® XD 20

Art.-No.

3021

Dimensions

ca. 1,00 m x 20,00 m

Unit

roll à 20 m²

* If the waterproofing is not root resistant, a Root Barrier 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.

Fixing devices are needed where there is a strip of vegetation between the guardrail and the attica, as can be seen in this photo on the right.

However, if the guardrail is directly adjacent to the attica, different guardrails such as the Fallnet® ASG (Maintenance Guardrail) or the system guardrail can offer collective safety. This means that anyone working on the roof is protected without the need to apply other measures.



Fallnet® SB 200-Rail was designed especially for the use in combination with ZinCo Solar Base SB 200. The periphery of the existing photovoltaic system is also used for the fixing device. All you need in addition is a rail, rail supports and project related accessories. This allows for the quick and inexpensive installation of a fall protection system efficiently and perfectly integrated into the roof landscape.

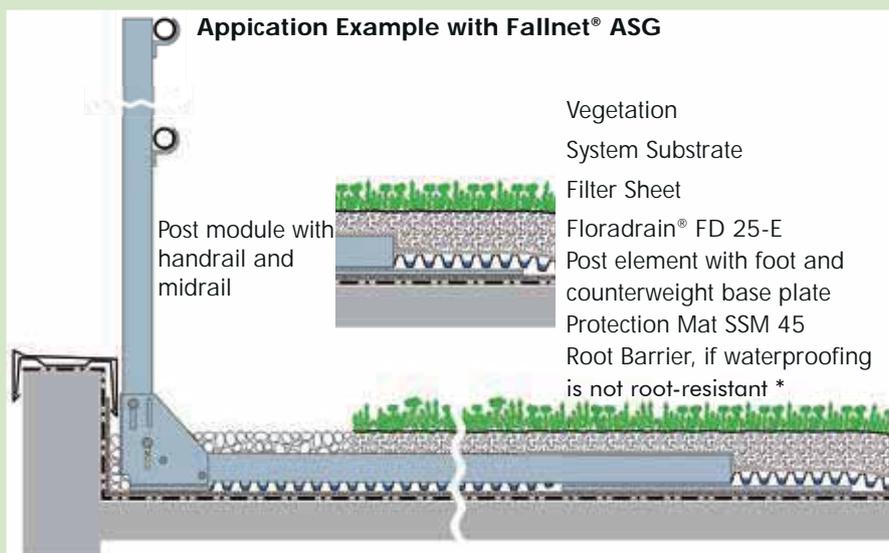
The horizontally installed rail allows for the use of the whole radius surrounding the gliding runner, which is an ideal and efficient application on narrow roofs. The ZinCo Fallnet® SR Rail system can also be combined with railings and photovoltaic systems.

ZinCo Railing Solutions – attractive, functional and installed on the roof without penetration of the waterproofing. The Guardrail Base is universally suitable for ZinCo railing systems made of stainless steel or galvanized steel and can also be combined with individual designs.

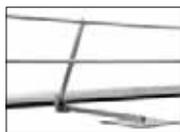
Green Roofs with "Fallnet® "

Features:

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



For protection when working



Fallnet® ASG

Edge protection system according to EN 13374 class A as a collective protection during maintenance works on extensive flat Green Roofs with an upstand and an inclination of up to 5°. The installation takes place without roof penetrations with load applied over the entire surface. The Maintenance Guardrail can be installed either vertically or with an inclination of 67.5°.



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® 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

Fixing Device, consisting of single grid elements which are plugged together to one unit and to be covered with min. 90 kg/m² superimposed load.

For emergency escape routes and recreational areas



Railing System SG 40-E made of stainless steel

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 made of galvanized steel

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.



Guardrail Base GB

Made of profiled ABS (Acrylonitrile Butadiene Styrene) plastic with integrated aluminium profiles on the underside and a post support profile with a fixing flange made of galvanized steel. All-purpose for posts with a fixing flange (hole distance 100 x 75 mm).

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

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.

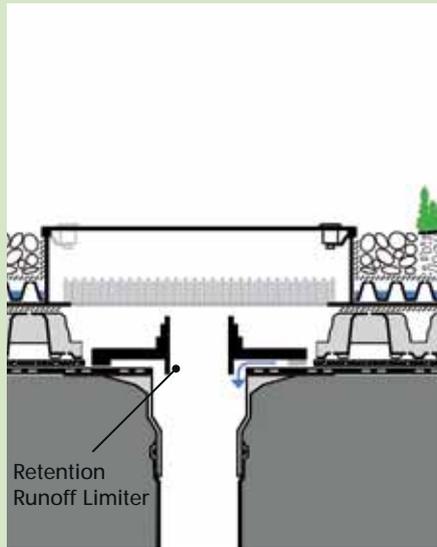
First of all, a large proportion of the precipitation is retained on the roof area with a stormwater management roof, in the full sense of expanded flood control, and is then released over a pre-defined period (e.g. 24 hours) into the drainage system. All elements that are important for the correct functioning 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" with the example of "Sedum Carpet"

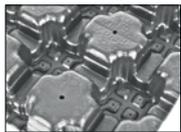
Features:

- 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.

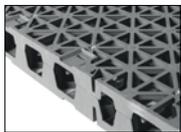


Plant level "Sedum Carpet"
 System Substrate "Sedum Carpet"
 Filter Sheet SF
 Floradrain® FD 25-E
 Filter Sheet PV
 Retention-Spacer RS 60
 Filter Sheet PV

For more information on the components of the system build-up "Sedum Carpet" (Sedum Cuttings, System Substrate, Filter Sheet SF and Floradrain® FD 25-E), see page 6 of this planning guide.



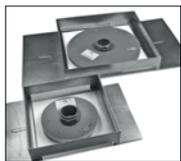
	Art.-No.	Dimensions	Unit	Pallet
Retention-Spacer RS 60	3408	ca. 2.30 m × 1.03 m (netto 2.25 m × 1.00 m)	board à 2.25 m ²	100 boards



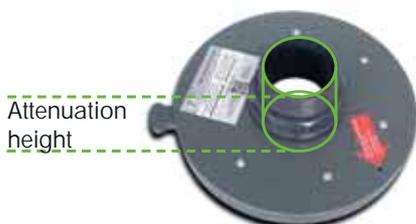
	Art.-No.	Dimensions	Unit	Pallet
Retention Spacer RSX 65	3402	ca. 0,60 m × 0,60 m	piece à 0,36 m ²	53,28 m ²
Retention Spacer RSX 80	3409	ca. 0,60 m × 0,60 m	piece à 0,36 m ²	43,20 m ²
Retention Spacer RSX 100	3403	ca. 0,60 m × 0,60 m	piece à 0,36 m ²	34,56 m ²
Retention Spacer RSX 150	3415	ca. 0,60 m × 0,60 m	piece à 0,36 m ²	23,04 m ²



	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.	Consisting of:	Unit
Retention Runoff Limiter Set RDS 48	4002	Run-off Limiter RD 48 and Inspection chamber KS 10/57	set
Retention Runoff Limiter Set RDS 28	4000	Run-off Limiter RD 28 and Inspection chamber KS 10/40	set



System Build-up “Sponge City Roof”



Temporary water retention, maximum water storage and increased evaporation

This system build-up combines the advantages of an insect-friendly, species-rich extensive green roof with an additional water storage element available to the plants and temporary water retention capacity with run-off limiter.

The accumulated water stored in the retention spacer on the waterproof membrane level is available to the plants through the wicking mat. Rainwater is collected above the retention spacer up to a pre-defined level and is discharged at the required flow rate.

This results in a dynamic development of the vegetation depending on the annual precipitation distribution. We recommend having the final and also the development care and maintenance regime carried out by specialists. Additional irrigation may be necessary during long drought periods during the summer.

The accumulated water should be removed during the winter months and, depending on the geographic region, reinstated at the start of the following vegetation period.

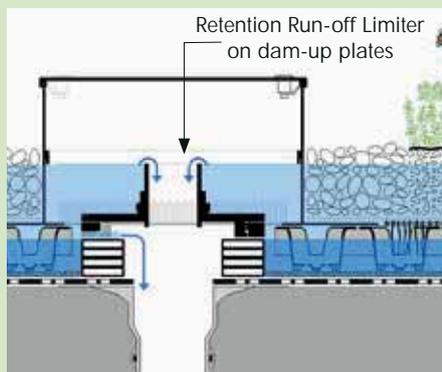
A roof design with 0° slope is a basic requirement for this build-up.



System Build-up "Sponge City Roof" with Retention Spacer RS 60

Features:

- Species-rich, insect-friendly extensive green roof
- Additional water storage element available to the plants
- Temporary water retention capacity with run-off limiter
- A roof design with 0° slope is a basic requirement.



Vegetation, e. g. "Bee Pasture"
 System Substrate "Rockery Type Plants"
 Wicking Mat DV 40
 Retention Spacer RS 60
 Retention Run-off Limiter
 Filter Sheet PV
 Roof construction with root resistant waterproofing

- Temporary water retention volume
- Periodic plant available water accumulation

	System Substrate "Rockery Type Plants"	Unit big bag	Art.-No. 612101	Unit bulk	Art.-No. 612201	Unit silo	Art.-No. 612301
	Wicking Mat DV 40	Art.-No. 2160 2165	Dimensions ca. 2,00 m × 25,00 m ca. 2,00 m × 10,00 m	Unit Rolle à 50 m ² Rolle à 20 m ²			
	Retention-Spacer RS 60	Art.-No. 3408	Dimensions ca. 2.30 m × 1.03 m (netto 2.25 m × 1.00 m)	Unit board à 2.25 m ²	Pallet 100 boards		
	Retention Runoff Limiter Set RDS 48	Art.-No. 4002	Consisting of: Run-off Limiter RD 48 and Inspection chamber KS 10/57	Unit set			
	Retention Runoff Limiter Set RDS 28	Art.-No. 4000	Run-off Limiter RD 28 and Inspection chamber KS 10/40	Unit set			
	Filter Sheet PV	Art.-No. 2131	Dimensions ca. 2.00 m × 50.00 m	Unit 100 m ² -roll	Pallet 900 m ²		

System Build-up “Urban Climate Roof”

One of the challenges for buildings of the future is the issue of water management. In terms of precautionary measures for heavy rainfall events, the topic “rainwater retention” (see page 36) is important. However, it is sometimes no longer sufficient to merely retain rainwater on the roof temporarily and release it into the sewer system in a controlled manner. Very often this option is simply not available and, increasingly, precipitation should not even be released into the sewer system. This begs the question:

Where is the water to go? Evaporation!

One option is to store the water, for example, in a cistern, or to allow it to seep into the ground. If that is not possible or not sufficient, then the green roof can offer the advantage of storing as much water as possible and letting it evaporate.

The system build-up Stormwater Management Roof is installed over a large area and has enormous potential. The plant community developed specifically for this build-up boasts an extremely high level of evaporation capacity. In turn, evaporation results in a cooling of the surrounding area. This is an important effect particularly given the continuous heating up of our (inner) cities. Demand-driven irrigation with expansive



distribution of the water is required to ensure permanent cooling.

In order to meet environmental demands, the vegetation was selected as part of a comprehensive research project with particular regard to its suitability for grey water irrigation.

The protected utility model, Aquafleece AF 300, is at the heart of the build-up. The

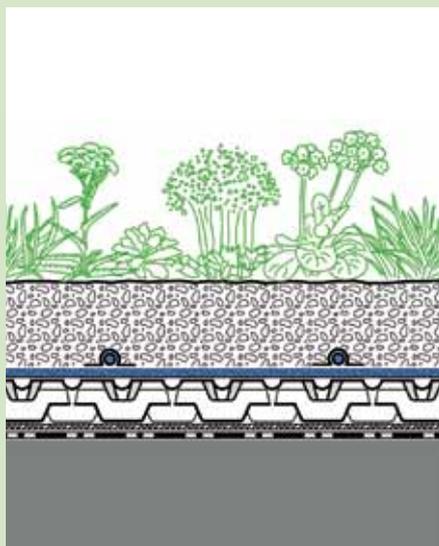
combination of the highly effective capillary fleece with woven material means that the water supplied through dripperlines is distributed by the Aquafleece for irrigation, while excess water resulting from precipitation can seep downwards over an expansive area. This provides for balanced irrigation while effectively preventing water from collecting in the substrate.



**System Build-up
"Urban Climate Roof"
with Floraset® FS 50**

Features:

- Green Roof build-up designed for a maximum evaporation, which can actively contribute to an improvement of city climate in particular during hot and dry periods.
- Irrigation takes place via special dripperlines which are fastened with a hook & loop tape to the Aquafleece AF 300.
- Different resources can be considered regarding the water supply, e.g. (stored) rainwater, gray water or groundwater.



Plant community "Urban Climate Roof"

System Substrate "Rockery Type Plants"

Dripperline 500-L2, fastened by means of hook & loop tape

Aquafleece AF 300

Floraset® FS 50

Protection Mat TSM 32

Root Barrier, if waterproofing is not root-resistant *



Plant community "Urban Climate Roof" on request



System Substrate "Rockery Type Plants"

Unit	Art.-No.	Unit	Art.-No.	Unit	Art.-No.
big bag	612101	bulk	612201	silo	612301



Dripperline 500-L2

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



Aquafleece AF 300

Art.-No.	Dimensions	Unit
2120	ca. 2.00 m × 50.00 m	105 m ² roll



Floradrain® FD 40-E
Floradrain® FD 40-RV
(Roll & Filter Sheet)

Art.-No.	Dimensions	Unit	Pallet
3041	ca. 0.96 m × 2.08 m	2 m ² -board	250 boards
3042	ca. 0.94 m × 10.70 m	10 m ² -roll	



Protection Mat SSM 45

Art.-No.	Dimensions	Unit
2045	ca. 2.00 m × 50.00 m	100 m ² -roll

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

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).

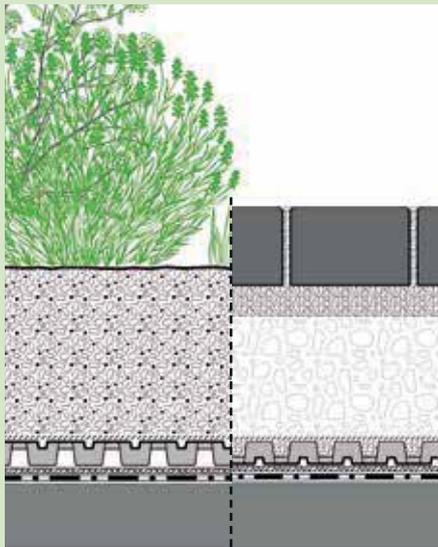
Stabilodrain® SD 30 can also be installed on inverted roofs, where it is essential to avoid creating a vapour barrier above the XPS insulation material.



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

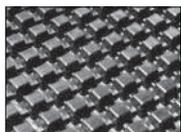
Concrete or natural stone pavers are chosen according to the anticipated load demand and should meet the requirements of relevant standards. A greater paver depth results in a greater support surface and in a reduction of a possible distortion of the bedding material underneath. With driveways

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

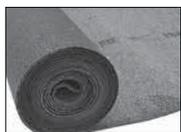
the joint material to prevent it from being washed out. The ZinCo Technical Department provides assistance with designing the appropriate build-up. Please contact us for more information.



Filter Sheet PV	Art.-No. 2131	Dimensions ca. 2.00 m × 50.00 m	Unit 100 m ² -roll	Pallet 900 m ²
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Stabilodrain® SD 30	Art.No. 3330	Dimensions ca. 0.94 m × 2.00 m	Unit 1.88 m ² board	Pallet 150 boards
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Protection Mat ISM 50	Art.-No. 2050	Dimensions ca. 2.00 m 25.00 m	Unit 50 m ² -roll	
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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”



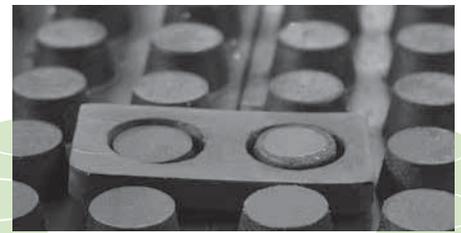
Driveways on roofs require both a load-bearing System Build-up and an adequate strength in roof construction. Moreover, vehicular traffic on a roof deck induces very significant horizontal forces and torsional movements through steering, breaking and accelerating, that must be absorbed.



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



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



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.

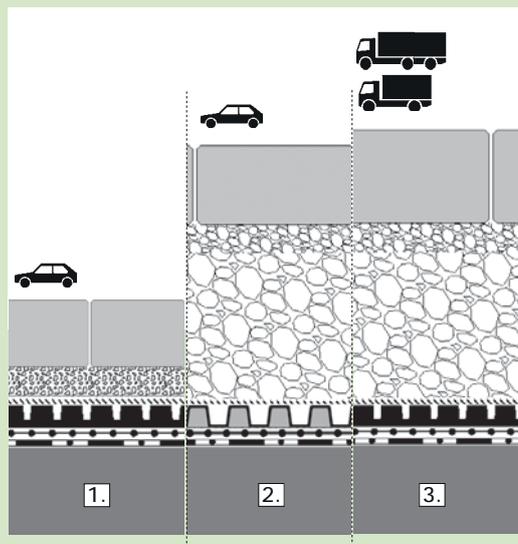
The thickness of the pavers or concrete slabs must enable a horizontal absorption of forces. For wheel loads exceeding 1 ton, a load distributing base layer has to be designed. Extreme stresses require extremely good protection layers in order to protect the waterproofing. Here again the Elastodrain® 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 recommendations of bedding layers please contact us.



	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
Filter Sheet PV	2131	ca. 2.00 m × 50.00 m	100 m ² -roll	900 m ²



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



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



	Art.-No.	Dimensions	Unit	Pallet
Slip Sheet TGF 20	1020	ca. 8.00 m × 25.00 m	200 m ² -roll	6600 m ²
	1022	ca. 3.00 m × 33.50 m	100.5 m ² -roll	2211 m ²

European Technical Assessment for ZinCo Green Roof Systems

In 2013 ZinCo received European Technical Approval ETA with the number 13/0668 for a wide range of proven green roof systems. Since June 2018, the European Technical Approval has been replaced by the European Technical Assessment.

the other hand, it reassures architects, contractors and owners that the relevant systems and products have passed the mandatory proof procedures and are in accordance with the assessment requirements.



Details can be found here:
www.zinco-greenroof.com/european-technical-assessment

On the one hand, this is a prerequisite for unrestricted access to the European market and its contracting states and, on

The following system build-up versions have European Technical Assessment:

	Extensive green roof "Sedum Carpet"	Extensive green roof "Rockery Type Plants"	Simple intensive green roof "Heather with Lavender"	Intensive green roof "Roof Garden"
Root barrier (optional) Schutzmatte	(Root Barrier WSB 100-PO) Protection Mat TSM 32 / Protection Mat SSM 45	(Root Barrier WSB 100-PO) Protection Mat TSM 32 / Protection Mat SSM 45	Root Barrier WSB 100-PO Protection Mat SSM 45	(Root Barrier WSB 100-PO) Protection Mat ISM 50
Drainage element	Floradrain® FD 25-E Fixodrain® XD 20	Floradrain® FD 25-E	Floradrain® FD 40-E	Floradrain® FD 60 neo
Filter sheet Substrate layer	Filter Sheet SF System Substrate "Sedum Carpet"	Filter Sheet SF System Substrate "Rockery Type Plants"	Filter Sheet SF System Substrate "Heather with Lavender"	Filter Sheet SF System Substrate "Lawn" System Substrate "Roof Garden"

Further ZinCo systems are currently undergoing final testing and will be incorporated into the European Technical Assessment at a later date.

ENVIRONMENTAL PRODUCT DECLARATION (EPD)

The Environmental Product Declaration (EPD) has been created as an instrument which reliably shows the environmental impact of construction products throughout their complete life cycle and describes their functional and technical properties.

Transparent environmental information has always been of major relevance to ZinCo. For that reason ZinCo has created an EPD for the Green Roof System

"Heather with Lavender" which has now been verified and published. It is a so-called "Core EPD". The life cycle assessment data of most extensive or intensive ZinCo Green Roof Systems can be provided by means of its tested and verified annex.

The internationally recognized EPDs form an essential cornerstone of the building certification systems of e.g. DGNB, BREEAM or LEED. They allow for

comparisons of products or services with the same function and provide an important basis for the sustainability assessment of buildings.



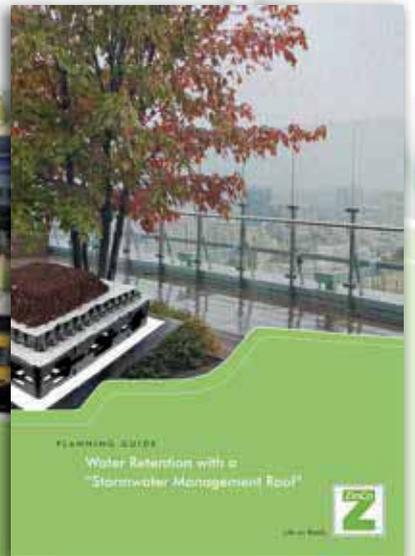
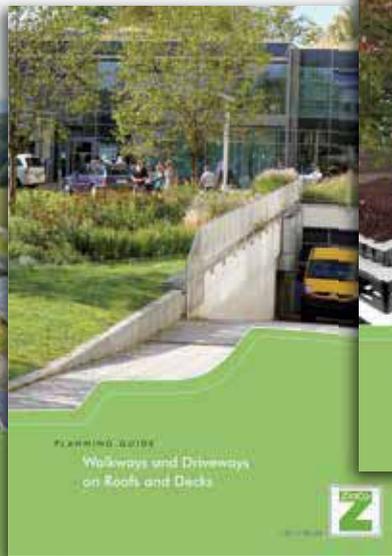
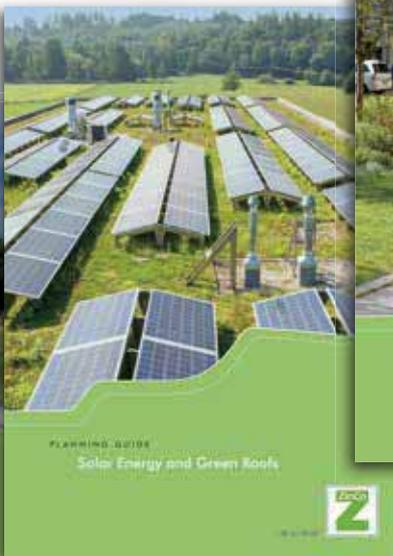
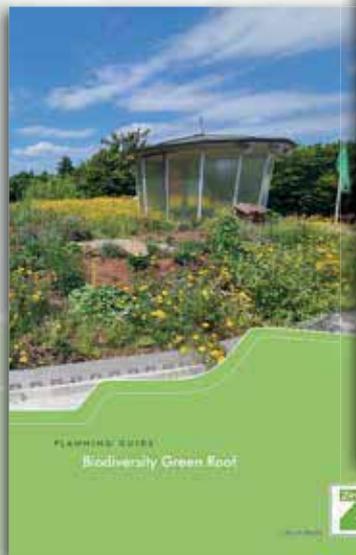
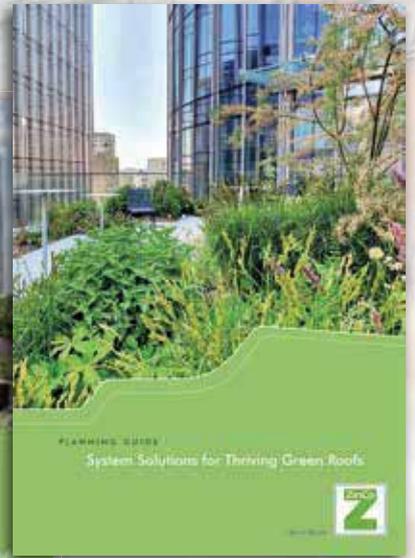
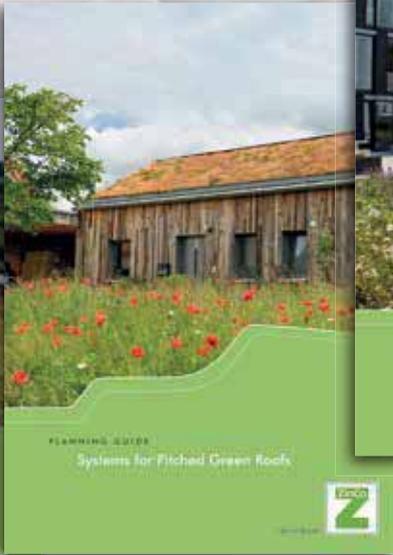
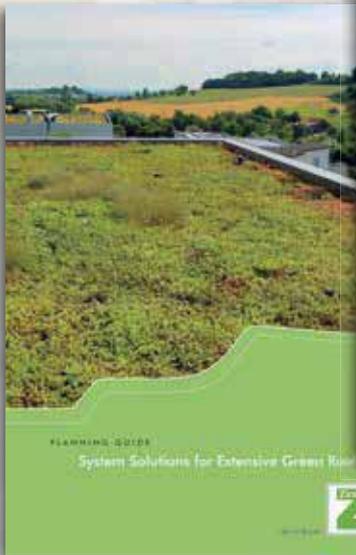
Details can be found here:
www.zinco-greenroof.com/epd

An Environmental Product Declaration (EPD) contains comprehensive life cycle assessment data, therefore providing information about the environmental impact of the building product.

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An entire world full of utilised roofscapes!

Discover so much more about green roofs, solar and new habitats.



For this and many more brochures, see www.zinco.de/downloads.

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.



System Build-ups with
European Technical Assessment

www.zinco-greenroof.com/european-technical-assessment



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