



PLANNING GUIDE

System Solutions for Thriving Green Roofs

Life on Roofs



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Intensive Green Roofs

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The Roofs of the Future are Green

Roofs are more than just “functional components” for the protection of the building structure. Roofs give character to individual buildings and entire city districts. Beyond that, roofs are more and more considered as open resource areas. They attract urban planners looking for socially responsible concepts that counteract the loss of natural living space and provide solutions for problems such as stormwater management and urban heat island effect in densely populated cities.

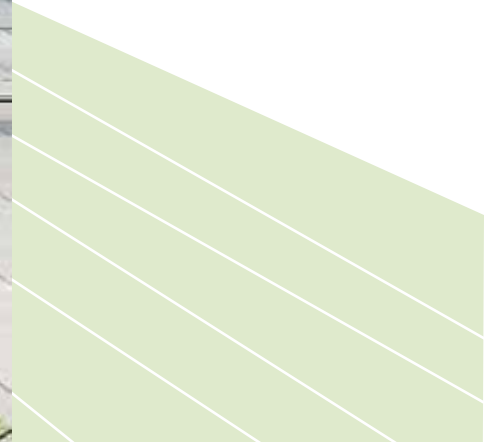
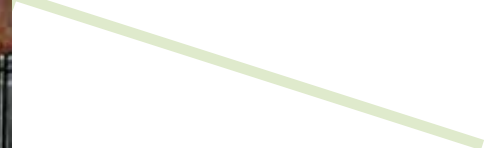
Green Roofs are extending the formal language of contemporary architecture and confer a new significance and value on the concept of “Roof Landscape”:

Nature – increasingly ousted by buildings and paved surfaces – returns as an attractive green element in residential, recreational and working environments. ZinCo – as the global market players – are pioneers and innovators in the field of extensive and intensive roof greening. Research projects and innovative systems developed by ZinCo inspire architects and demanding clients to plan both private and large public buildings in a holistic and sustainable way.

ZinCo are based in Germany, with offices in almost 30 countries throughout Europe, Asia and the Americas. We install over 1.5 million square meters of Green Roof systems annually on commercial, residential, industrial and institutional

buildings. Our lightweight, durable Green Roof systems leverage German-engineered technology to imitate the beauty of nature and deliver superior environmental and economic benefits to building owners and communities all over the world.

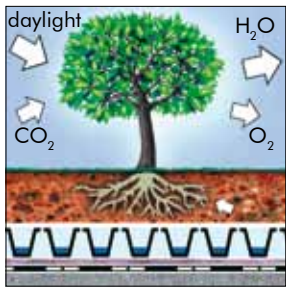
People, their relationship to nature and life in an ecologically intact environment – this is what matters to us.



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



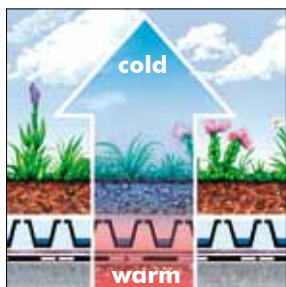
A Green Roof can reduce water run-off by 50-90%; any water flows from the roof with a delay. Outlets, pipes and drains can be reduced in capacity, thereby saving construction costs. Sewer costs can be reduced in some areas.

Improve Noise Protection



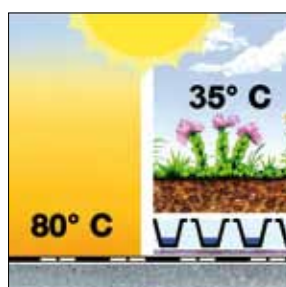
Planted areas are natural sound insulators and absorb more sound than hard surfaces. Green Roofs reduce reflective sound by up to 3 dB and improve sound insulation by up to 8 dB. This is very effective for buildings near airports, noisy nightclubs and factories.

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.

Types of Green Roofs

Extensive Green Roofs

- **minimal maintenance required**
 - inspection 1-2 x / year
 - supply of water and nutrients mostly 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**



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.

They 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.

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**

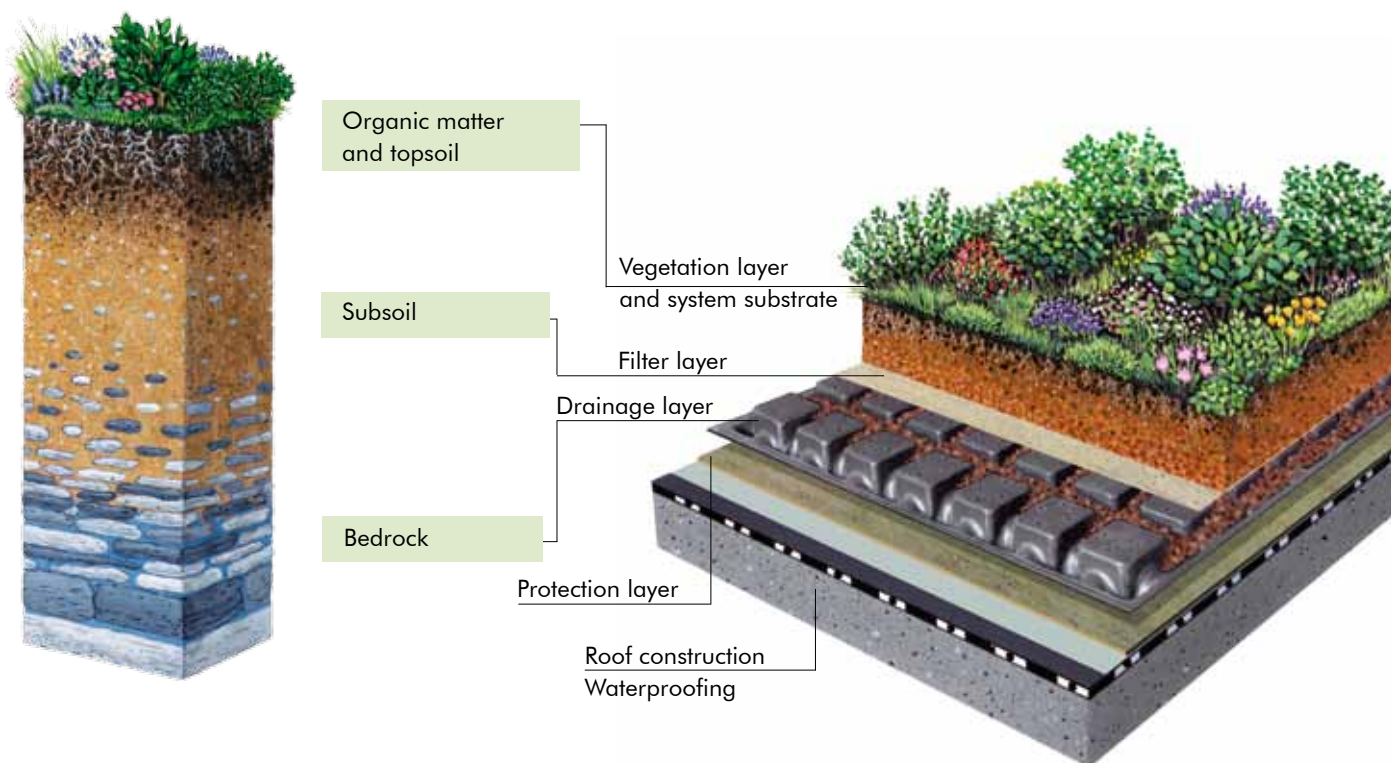


Intensive Green Roof

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 a number of 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
- 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

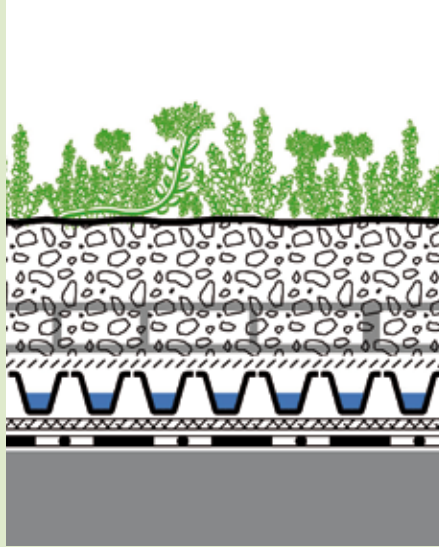
particularly in autumn and are a nice change in the Green Roof's appearance. Sedum cuttings are produced by cutting off the shoot tips of selected types of Sedum. This is only possible during the non-flowering period (spring or autumn), as flowering shoots do not easily grow roots. With Sedum cuttings, good ground cover is achieved within 2-3 years. A faster ground coverage is achieved with plug planting.



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

System Substrate "Sedum Carpet"
≥ 80 mm*

Fallnet®

Filter Sheet SF

Floradrain® FD 25-E

Protection Mat SSM 45

Root Barrier WSF 40, if waterproofing
is not root-resistant

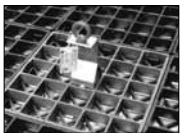
* if there is enough rainfall, maybe less



| | 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 | silobag | 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 x 100.00 m | 200 m ² -roll | 4600 m ² |
| | 2102 | ca. 1.00 m x 100.00 m | 100 m ² -roll | 2500 m ² |
| | 2101 | ca. 2.00 m x 10.00 m | 20 m ² | |



| | Art.-No. | Dimensions | Unit | Pallet |
|--|----------|----------------------|-------------------------|------------|
| Floradrain® FD 25-E | 3028 | ca. 1.00 m x 2.00 m | 2 m ² -board | 200 boards |
| Floradrain® FD 25-R (Roll) | 3023 | ca. 1.00 m x 15.00 m | 15 m ² -roll | |
| Floradrain® FD 25-RV (Roll & Filter Sheet) | 3022 | ca. 1.00 m x 15.00 m | 15 m ² -roll | |



| | Art.-No. | Dimensions | Unit |
|-----------------------|----------|----------------------|--------------------------|
| Protection Mat SSM 45 | 2045 | ca. 2.00 m x 50.00 m | 100 m ² -roll |



| | Art.-No. | Dimensions | Unit | Pallet |
|---------------------|----------|----------------------|----------------------------|---------------------|
| Root Barrier WSF 40 | 1040 | ca. 8.00 m x 25.00 m | 200 m ² -roll | 4600 m ² |
| | 1041 | ca. 6.25 m x 20.00 m | 125 m ² -roll | 2500 m ² |
| | 1043 | ca. 2.00 m x 50.00 m | 100 m ² -roll | 2600 m ² |
| | 1044 | ca. 3.00 m x 33.50 m | 100.5 m ² -roll | 2211 m ² |
| | 41040 | ca. 6.25 m x 3.20 m | 20 m ² | 600 m ² |

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.

Excess water is drained away by the Floradrain® element.

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.

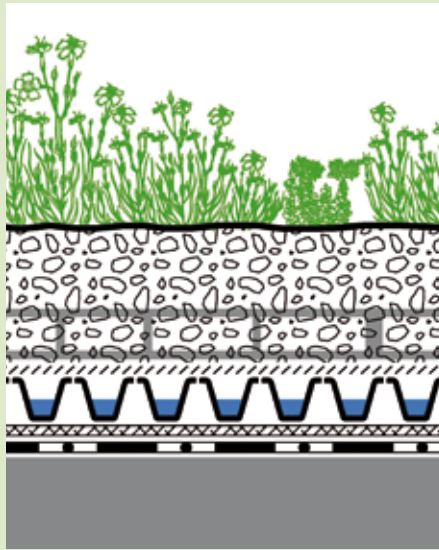
The System Build-up “Rockery Type Plants” can also be combined with seed-sowing. Different seed mixtures, such as “Meadow Scents”, “Country Colours” and “Grassy Pasture” provide Green Roofs with attractive “back to nature” appearance.



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 WSF 40, if waterproofing
is not root-resistant

* if there is enough rainfall, maybe less



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 | 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)



Filter Sheet SF

| Art.-No. | Dimensions | Unit | Pallet |
|----------|-----------------------|--------------------------|---------------------|
| 2100 | ca. 2.00 m x 100.00 m | 200 m ² -roll | 4600 m ² |
| 2102 | ca. 1.00 m x 100.00 m | 100 m ² -roll | 2500 m ² |
| 2101 | ca. 2.00 m x 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 x 2.00 m | 2 m ² -board | 200 boards |
| 3023 | ca. 1.00 m x 15.00 m | 15 m ² -roll | |
| 3022 | ca. 1.00 m x 15.00 m | 15 m ² -roll | |



Protection Mat SSM 45

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



Root Barrier WSF 40

| Art.-No. | Dimensions | Unit | Pallet |
|----------|----------------------|----------------------------|---------------------|
| 1040 | ca. 8.00 m x 25.00 m | 200 m ² -roll | 4600 m ² |
| 1041 | ca. 6.25 m x 20.00 m | 125 m ² -roll | 2500 m ² |
| 1043 | ca. 2.00 m x 50.00 m | 100 m ² -roll | 2600 m ² |
| 1044 | ca. 3.00 m x 33.50 m | 100.5 m ² -roll | 2211 m ² |
| 41040 | ca. 6.25 m x 3.20 m | 20 m ² | 600 m ² |

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 drowning the plants. The standard 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, but not heavier compared to a standard build-up.

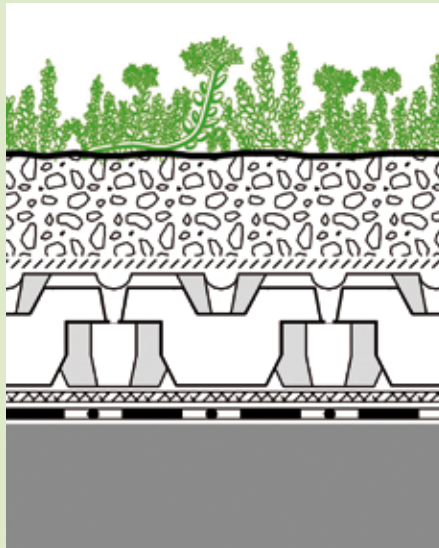
The Floraset® elements are made of expanded polystyrene thus they are light-weight.



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 Cuttings 25 g/m²

System Substrate "Rockery Type Plants"
≥ 80 mm

Filter Sheet SF

Floraset® FS 50 (FS 75)

Protection Mat TSM 32
Root Barrier WSF 40, 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 |



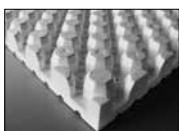
| | Unit | Art.-No. | Unit | Art.-No. | Unit | Art.-No. |
|---|---------|----------|------|----------|-------|----------|
| System Substrate "Rockery Type Plants" | big bag | 612101 | bulk | 612201 | silos | 612301 |



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



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



| | Art.-No. | Dimensions | Unit | Pallet |
|-------------------|----------|---------------------|-------------------------|-----------|
| Floraset® FS 50-E | 3050 | ca. 1.00 m x 1.00 m | 1 m ² -board | 54 boards |
| Floraset® FS 75 | 3076 | ca. 1.00 m x 1.00 m | 1 m ² -board | 36 boards |



| | Art.-No. | Dimensions | Unit |
|-----------------------|----------|----------------------|--------------------------|
| Protection Mat TSM 32 | 2032 | ca. 2.00 m x 50.00 m | 100 m ² -roll |



| | Art.-No. | Dimensions | Unit | Pallet |
|---------------------|----------|----------------------|----------------------------|---------------------|
| Root Barrier WSF 40 | 1040 | ca. 8.00 m x 25.00 m | 200 m ² -roll | 4600 m ² |
| | 1041 | ca. 6.25 m x 20.00 m | 125 m ² -roll | 2500 m ² |
| | 1043 | ca. 2.00 m x 50.00 m | 100 m ² -roll | 2600 m ² |
| | 1044 | ca. 3.00 m x 33.50 m | 100.5 m ² -roll | 2211 m ² |
| | 41040 | ca. 6.25 m x 3.20 m | 20 m ² | 600 m ² |

System Build-up on Inverted Roofs



The characteristic of an inverted roof is that the insulation is above the waterproofing. The extruded polystyrene insulation (XPS) 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.

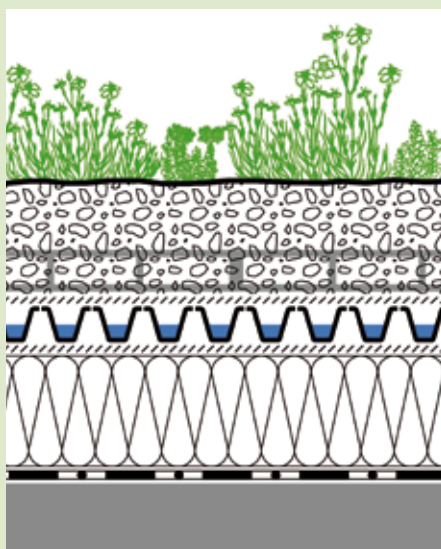
Layers that prevent moisture from diffusing out mustn't be installed over the thermal insulating XPS boards and the layer above should be vapour permeable. The protection mat has to be replaced by the permeable separation membrane TGV 21. If a root barrier is required, it has to be placed below the insulation 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 WSF 40, if waterproofing
is not root-resistant



Plug Plants FB 50
"Rockery Type Plants"

| Art.-No. | Unit |
|----------|-------------------|
| 8120 | tray with 50 pcs. |



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 x 100.00 m | 200 m ² -roll | 4600 m ² |
| 2102 | ca. 1.00 m x 100.00 m | 100 m ² -roll | 2500 m ² |
| 2101 | ca. 2.00 m x 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 x 2.00 m | 2 m ² -board | 200 boards |
| 3023 | ca. 1.00 m x 15.00 m | 15 m ² -roll | |
| 3022 | ca. 1.00 m x 15.00 m | 15 m ² -roll | |



Separation Membrane TGV 21

| Art.-No. | Dimensions | Unit | Pallet |
|----------|-----------------------|--------------------------|---------------------|
| 2180 | ca. 1.60 m x 250.00 m | 400 m ² -roll | 3600 m ² |
| 2185 | ca. 1.60 m x 50.00 m | 80 m ² -roll | 1600 m ² |



Root Barrier WSF 40

| Art.-No. | Dimensions | Unit | Pallet |
|----------|----------------------|----------------------------|---------------------|
| 1040 | ca. 8.00 m x 25.00 m | 200 m ² -roll | 4600 m ² |
| 1041 | ca. 6.25 m x 20.00 m | 125 m ² -roll | 2500 m ² |
| 1043 | ca. 2.00 m x 50.00 m | 100 m ² -roll | 2600 m ² |
| 1044 | ca. 3.00 m x 33.50 m | 100.5 m ² -roll | 2211 m ² |
| 41040 | ca. 6.25 m x 3.20 m | 20 m ² | 600 m ² |

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.

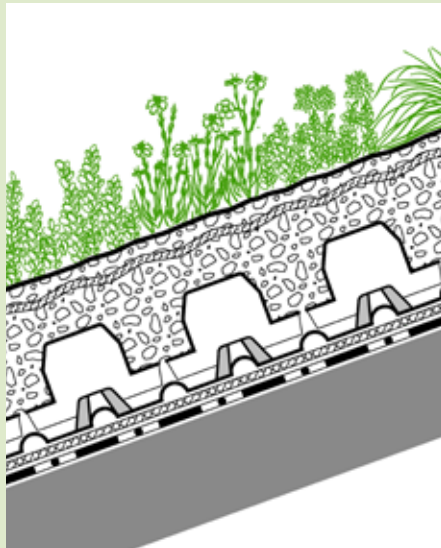


It is very important to take the Green Roof upkeep and maintenance aspects into account from the early planning stage of the project on. Skylights can be installed as access for the maintenance personnel.

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

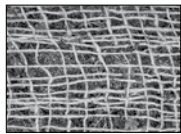
Floraset® FS 75
Protection Mat BSM 64



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 x 1.22 m

Unit
85.4 m²-bale

Pallet
683.2 m²



System Substrate
"Rockery Type Plants"

Unit
big bag

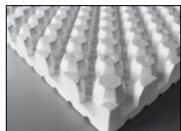
Art.-No.
612101

Unit
bulk

Art.-No.
612201

Unit
silo

Art.-No.
612301



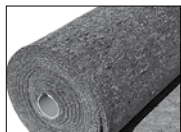
Floraset® FS 75

Art.-No.
3076

Dimensions
ca. 1.00 m x 1.00 m

Unit
1 m²-board

Pallet
36 boards

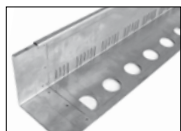


Protection Mat BSM 64

Art.-No.
2064

Dimensions
ca. 2.00 m x 25.00 m

Unit
50 m²-roll



Eaves Profile TRP 140

Art.-No.
7782

Dimensions
length 3 m,
height 140 mm

Unit
piece

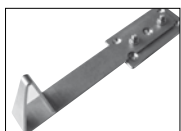


Support Bracket TSH 100

* see below comment Shear Fix

Art.-No.
9565

Unit
piece



Shear Fix LF 300

Art.-No.
9568

Unit
piece

A structural engineer is to determine whether support brackets are sufficient or shear barriers are required.

System Build-up “Steep Pitched Green Roof”

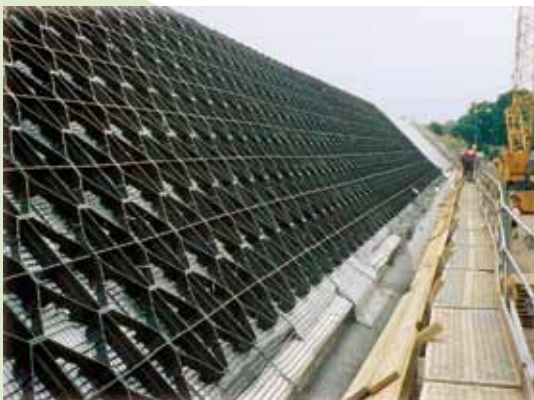


The System Build-up “Steep Pitched Green Roof”, based on the Georaster® elements, enables the installation of Green Roofs with slopes exceeding 20° and up to 35°. Above 35° special solutions can be designed by the ZinCo engineers. The Georaster® elements are made of recycled polyethylene (HD-PE) and 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.

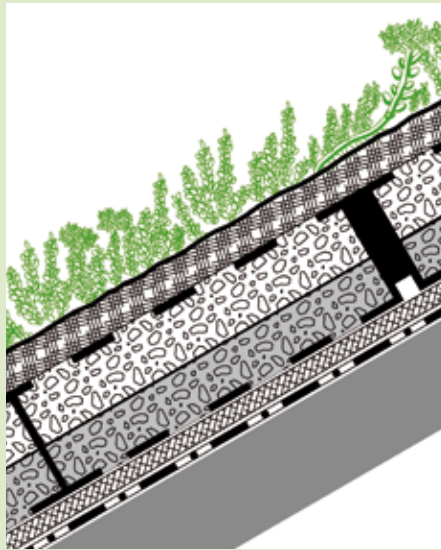
Georaster® elements can also be installed under reinforced lawns, footway constructions, in slope protection, etc.



System Build-up "Steep Pitched Green Roof"

Features:

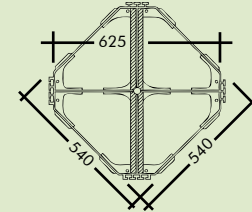
- Attractive pitched Green Roofs for root-proof and waterproofed roofs with slopes between 20° and 35°.
- Georaster® elements transfer the shear forces into the eaves or into additional shear barriers.
- Pitched Green Roofs require periodic maintenance. Depending on the location, slope and exposure, 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



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



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



| | | | | |
|------------|----------|---------------------|-------|-----------|
| Georaster® | Art.-No. | Dimensions | Unit | Pallet |
| | 3400 | ca. 0.54 m x 0.54 m | piece | 88 pieces |



| | | | |
|------------------------|----------|----------------------|-------------------------|
| Protection Mat WSM 150 | Art.-No. | Dimensions | Unit |
| | 2015 | ca. 1.00 m x 15.00 m | 15 m ² -roll |



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



| | | |
|--|----------|-------|
| Support Bracket TSH 100 * see below comment Shear Fix | Art.-No. | Unit |
| | 9565 | piece |



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

A structural engineer is to determine whether support brackets are sufficient or shear barriers are required.

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.

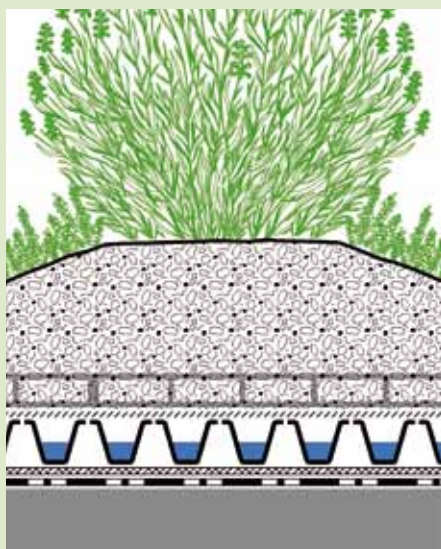
Floradrain® FD 40-E is a universal element for both extensive and intensive build-ups. It has a high drainage capacity and is also suitable for roofs without slope, provided residual ponding is less than 40 mm to keep the substrate clear of the water beneath. It is quick and easy to install as well as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

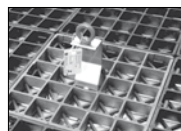
Fallnet®
Filter Sheet SF
Floradrain® FD 40-E
Protection Mat SSM 45
Root Barrier WSF 40, if waterproofing
is not root-resistant

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 |

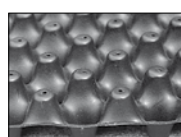


This System Build-up allows the integration of the Fallnet® Fixing Device for roofs with slopes up to 5° (see page 32-33)



Filter Sheet SF

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



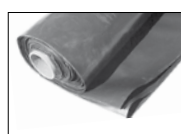
Floradrain® FD 40-E
Floradrain® FD 40-R (Roll)
Floradrain® FD 40-RV
(Roll & Filter Sheet)

| Art.-No. | Dimensions | Unit | Pallet |
|----------|----------------------|-------------------------|------------|
| 3041 | ca. 0.96 m x 2.08 m | 2 m ² -board | 150 boards |
| 3043 | ca. 0.94 m x 10.70 m | 10 m ² -roll | |
| 3042 | ca. 0.94 m x 10.70 m | 10 m ² -roll | |



Protection Mat SSM 45

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



Root Barrier WSF 40

| Art.-No. | Dimensions | Unit | Pallet |
|----------|----------------------|----------------------------|---------------------|
| 1040 | ca. 8.00 m x 25.00 m | 200 m ² -roll | 4600 m ² |
| 1041 | ca. 6.25 m x 20.00 m | 125 m ² -roll | 2500 m ² |
| 1043 | ca. 2.00 m x 50.00 m | 100 m ² -roll | 2600 m ² |
| 1044 | ca. 3.00 m x 33.50 m | 100.5 m ² -roll | 2211 m ² |
| 41040 | ca. 6.25 m x 3.20 m | 20 m ² | 600 m ² |

System Build-up “Summer Plains”

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 substrate. This results in a minimum weight of 300 kg/m² that not all roofs can bear.

With its System Build-up “Summer Plains”, 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® AT45 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.

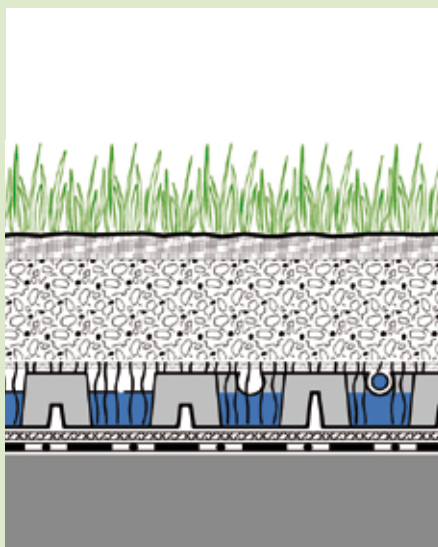
A lawn, for example, can be achieved with just 100 mm of system substrate, allowing for installation on many roofs that would not withstand the weight of a standard system.



System Build-up "Summer Plains"

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.



Vegetation

System Substrate "Lawn" ≥ 100 mm

Wicking Mat DV 40

Aquatec® AT 45 with Dripperline

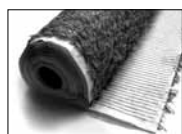
Filter Sheet PV

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

The vegetation for the System Build-up "Summer Plains" is available at garden centres. It can be applied by sowing, planting or with pre-cultivated mats.



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



| | Art.-No. | Dimensions | Unit |
|--|----------|----------------------|-------------------------|
| Wicking Mat DV 40 | 2160 | ca. 2.10 m x 25.00 m | 50 m ² -roll |
| | 2165 | ca. 2.10 m x 10.00 m | 20 m ² -roll |
| Roll width ca. 2.10 m including 10 cm fibre-free edge on one side for overlapping. | | | |



| | Art.-No. | Dimensions | Unit | Pallet |
|----------------|----------|---------------------|------------------------|------------|
| Aquatec® AT 45 | 3345 | ca. 1.02 m x 2.02 m | 2 m ² board | 100 boards |



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



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



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

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 waterfeatures. 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 watering. The spacious channels forming the underside of the Floradrain® FD 60 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

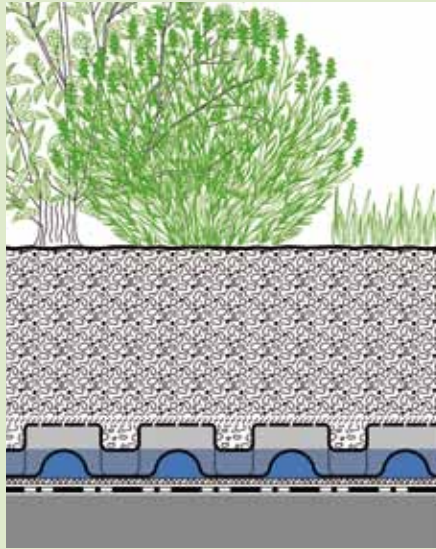
by installing roof dam elements above the roof outlets. A roof laid at 0° fall is required to include this system, along with a suitable waterproofing membrane for such use. Inspection chambers make it possible to examine and maintain the roof dam elements at any time. With automatic irrigation, a minimum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



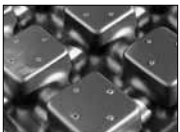
| | | | | |
|---------------------------------------|------------------------|---------------------------|---------------------|---------------------------|
| System Substrate "Roof Garden" | Unit big bag | Art.-No. 616101 | Unit bulk | Art.-No. 616201 |
|---------------------------------------|------------------------|---------------------------|---------------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



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



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



| | | | | |
|--------------------------|-------------------------|--|--|-----------------------------|
| Floradrain® FD 60 | Art.-No. 3060 | Dimensions ca. 1.00 m x 2.00 m | Unit 2 m ² -board | Pallet 100 boards |
|--------------------------|-------------------------|--|--|-----------------------------|



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



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

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.

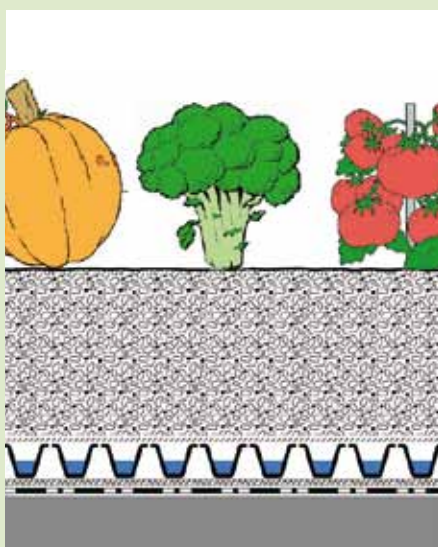
The specific requirements of a roof-top location (e.g. wind, structural requirements, water run-off and above all the issue of safety) must be addressed at the planning stage.



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 40-E
Protection Mat ISM 50
Root Barrier WSB 100-PO,
if waterproofing is not root-resistant

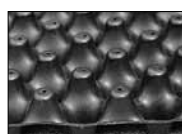
Suitable plants for the System Build-up "Urban Rooftop Farming" are available at garden centres or tree nurseries.



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



| | | | | |
|-----------------|----------|-----------------------|--------------------------|---------------------|
| Filter Sheet TG | Art.-No. | Dimensions | Unit | Pallet |
| | 2192 | ca. 2,00 m x 100,00 m | 200 m ² -roll | 1800 m ² |
| | 2193 | ca. 1,00 m x 100,00 m | 100 m ² -roll | 900 m ² |



| | | | | |
|--|----------|----------------------|-------------------------|------------|
| Floradrain® FD 40-E Floradrain® FD 40-R (Roll) Floradrain® FD 40-RV (Roll & Filter Sheet) | Art.-No. | Dimensions | Unit | Pallet |
| | 3041 | ca. 0.96 m x 2.08 m | 2 m ² -board | 150 boards |
| | 3043 | ca. 0.94 m x 10.70 m | 10 m ² -roll | |
| | 3042 | ca. 0.94 m x 10.70 m | 10 m ² -roll | |



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



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

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) .

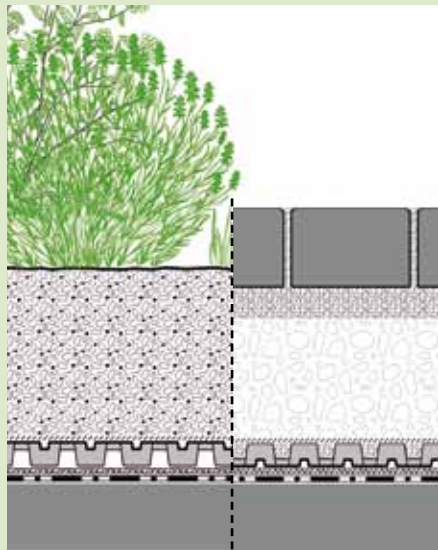
Stabilodrain® SD 30 can also be installed on inverted roofs, where it is essential to avoid creating a vapour barrier above the XPS insulation material.



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..
- 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,

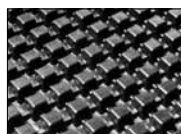
it is therefore crucial to plan sufficient load distribution, either through the paving surface or through an adequate base layer. Materials for base layers should ensure excellent compactibility and stability. Bedding material can come in different grain sizes, but has to harmonise with the joint material 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 x 50.00 m | Unit 100 m ² -roll | Pallet 900 m ² |
|------------------------|-------------------------|---|---|-------------------------------------|



| | | | | |
|----------------------------|------------------------|--|--|-----------------------------|
| Stabilodrain® SD 30 | Art.No. 3330 | Dimensions ca. 0.94 m x 2.00 m | Unit 1,88 m ² board | Pallet 150 boards |
|----------------------------|------------------------|--|--|-----------------------------|



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




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

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 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.

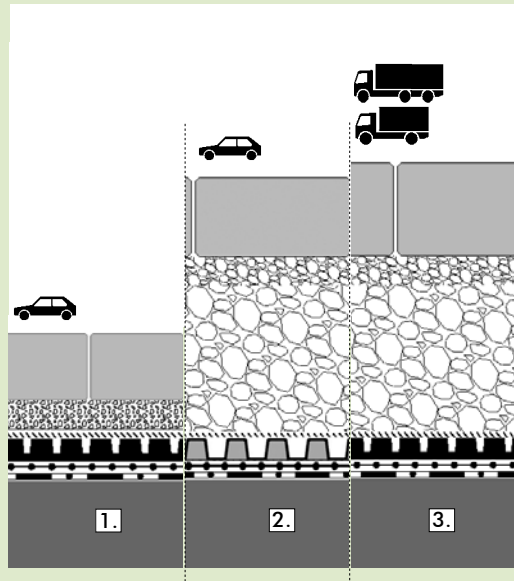


In addition two layers of Slip Sheet keep the horizontal forces issued by steering, breaking and accelerating away from the waterproofing level. The edge trim is very important too, as it contributes to the stability of the pavement. Its waterproofing must be sufficiently protected, too.

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.



Filter Sheet TG

Art.-No.

2192

Dimensions

ca. 2.00 m x 100.00 m

Unit

200 m²-roll

Pallet

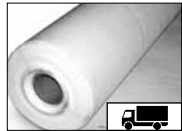
1800 m²

2193

ca. 1.00 m x 100.00 m

100 m²-roll

900 m²



Filter Sheet PV

Art.-No.

2131

Dimensions

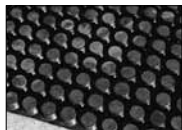
ca. 2.00 m x 50.00 m

Unit

100 m²-roll

Pallet

900 m²



Elastodrain® EL 202

Art.-No.

3220

Dimensions

ca. 1.00 m x 1.00 m

Unit

1 m² board

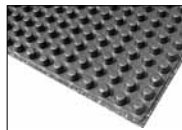
Pallet

50 boards

EL 202 Connector 2-holes

3221

bag 100 pieces



Protectodrain® PD 250

Art.-No.

3250

Dimensions

ca. 1.00 m x 2.00 m

Unit

2 m² board

Pallet

75 boards

PD 250-Connector

3251

Karton à 2 pieces



Slip Sheet TGF 20

Art.-No.

1020

Dimensions

ca. 8.00 m x 25.00 m

Unit

200 m²-roll

Pallet

6600 m²

1022

ca. 3.00 m x 33.50 m

100.5 m²-roll

2211 m²

System Build-up "SolarVert"



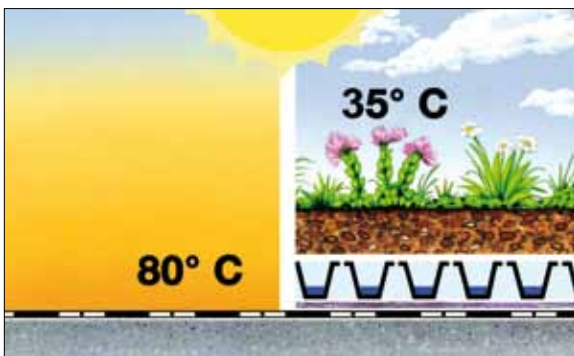
Green Roofs include a range of benefits. They can add thermal insulation, protect the waterproofing, improve biodiversity, retain storm water and improve the micro-climate. ZinCo extend the advantages of Green Roof technology with the development of support bases for solar panels. With the innovative 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.



Possible surface temperature on a hot summer day:



The efficiency of Solar Panels is improved with a Green Roof.

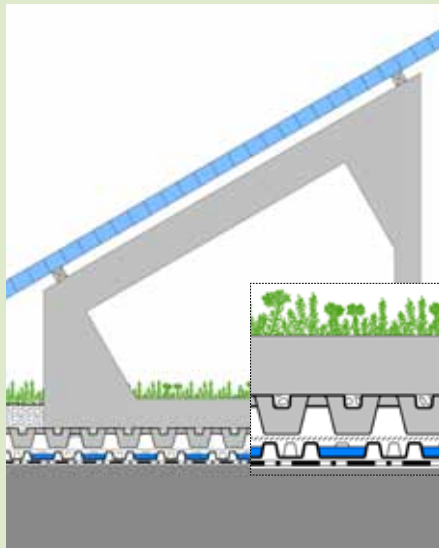
Photovoltaic panels convert sunlight into electrical current. Their efficiency deteriorates with increasing temperature. The cooling effect of a Green Roof can therefore significantly improve the efficiency of the solar panel.

i Proven data. Report available, upon request.

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.
- Unlimited drainage.
- The required substrate quantity depends on the project-specific analysis.



Solar Panel

Solar Base Frame SGR 35/90

Plug Plants FB 50 "Sedum Carpet" or
Sedum Cuttings
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



Sedum Cuttings

Plug Plants FB 50 "Sedum Carpet"

Art.-No.

8020

Unit

bag of 2 kg

8110

tray with 50 pieces



System Substrate
"Sedum Carpet"

Unit

big bag

Art.-No.

611101

Unit

bulk

Art.-No.

611201

Unit

silos

Art.-No.

611301



Solar Base SB 200

Art.-No.

3460

Dimensions

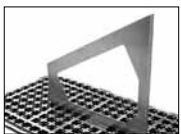
ca. 1.00 m x 2.00 m

Unit

board

Pallet

30 boards



Solar Base Frame
SGR Alu 35/90

Art.-No.

9700

Dimensions

950 x 350/900 mm

Unit

piece



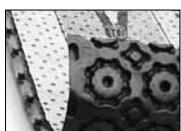
Wind Bracing
Stabilisation of two Solar Base Frames

Art.-No.

9710

Unit

piece



Fixodrain®XD20

Art.-No.

3021

Dimensions

ca. 1.00 m x 20.00 m

Unit

20 m²-roll



Root Barrier WSF 40

Art.-No.

1040

Dimensions

ca. 8.00 m x 25.00 m

Unit

200 m²-roll

Pallet

4600 m²

1041

ca. 6.25 m x 20.00 m

125 m²-roll

2500 m²

1043

ca. 2.00 m x 50.00 m

100 m²-roll

2600 m²

1044

ca. 3.00 m x 33.50 m

100.5 m²-roll

2211 m²

41040

ca. 6.25 m x 3.20 m

20 m²

600 m²

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. Since the launch of the Fallnet® product family at the Galabau 1998 (International Trade Fair For Urban Green and Open Spaces), the success story of these fall protection systems without roof membrane penetration has taken its course. 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 surcharge. 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 a minimum of 120 kg/m². The Fallnet® systems comply with the European Standard EN 795 Class E. They can be supplemented by wall-mounted fall anchors, 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.

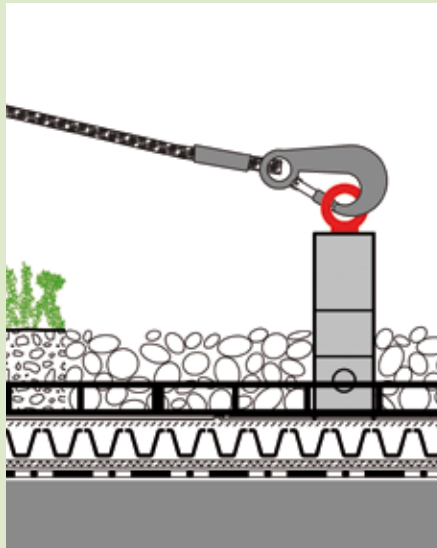


ZinCo Railing Solutions – attractive, functional and installed on the roof without penetration of the waterproofing.

Green Roofs with "Fallnet®"

Features:

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



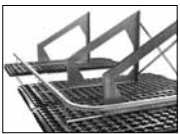
Fallnet® SR Anchorage point

Grid with Fallnet® base plate
Filter Sheet
Floradrain® FD 25-E
Protection Mat ISM 50
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/m² 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.



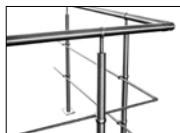
Fallnet® SR Rail

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 protective equipment according to European Standard EN 363 for work on roofs, compatible with the ZinCo Fixing Device Fallnet® and Fall Anchor. 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.



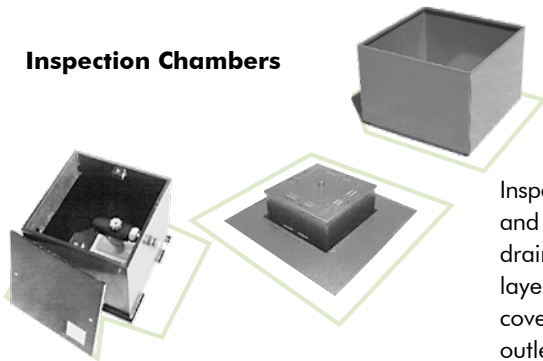
Railing System SG 40-S

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.

ZinCo Green Roof Accessories

The success of a Green Roof depends on the details. They have to be accurate and well-thought out, but the visual aspects are important, too. Along with their Green Roof Systems, ZinCo provide a full line of accessories that have been developed through their many year of experience, for the design of technically and aesthetically sound details. Here´s a selection.

Inspection Chambers



Inspection chambers made of galvanized and plastic-coated steel, used on top of drainage elements or within the substrate layer, with thermally insulated solid steel cover, high load bearing capacity; fits all outlet sizes. The drainage channels

SR 75 or SR 50 can be flange-mounted by connection pieces. The additional use of extension pieces KSA allows a higher System Build-up.

Drainage Channels

BTR | FTR | FR

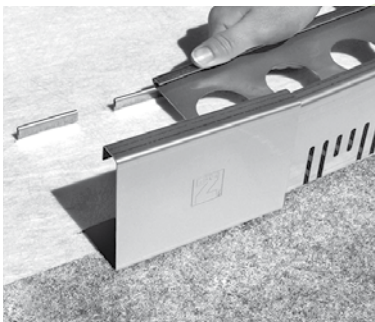
Water logging can be prevented in all connection and termination areas of the roof by taking appropriate protective measures. The ZinCo range of drainage channels provides permanent, working solutions for all roof situations.

The drainage channels available range from the purely functional to the aesthetically appealing. This product portfolio fulfils all requirements in terms of technical equipment, dimensions and material characteristics.

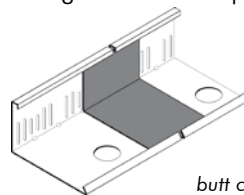


Eaves Profiles

DP 55 | DP 80 | DP 120



A metal angle profile used as a border for green areas, as a gravel retainer or where there is no parapet at the eaves or roof edge. Continuous perforation in the



butt connector

support leg allows the eaves profile to be permanently fixed to the waterproofing membrane, similar to a "rivet joint". Ob-long slots for water drainage: ca. 8.500 mm²/m, length: ca. 3 m.

Matching aluminium butt connectors for the professional connection (butt joint: ca. 5 mm) of the eaves profile. External corners to go with the required profile heights, leg lengths ca. 0.25 x 0.25 m.

Elefeet® Pedestals

Elefeet® H 40 | H 50 | H 80 | H 140

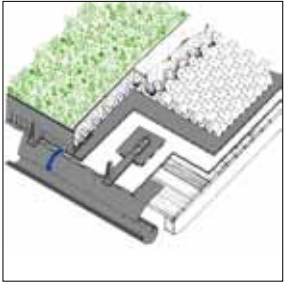


Continuously vertically adjustable pedestal, made of solid polypropylene for easy installation of slab pavement on flat and sloped areas. Integrated 3 mm thick joint spacers assure a linear appearance of the slabs and good drainage function. The adjustable heights from 40 to 400 mm can

be reached with four different standard types (heights of 40, 50, 80 and 140 mm) as well as two extension pieces (25 and 60 mm). The Elefeet® base plate with a diameter of 200 mm distributes the load evenly over the sub-construction.

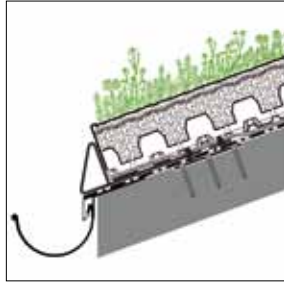
ZinCo Green Roof Application Details

Pitched Green Roof



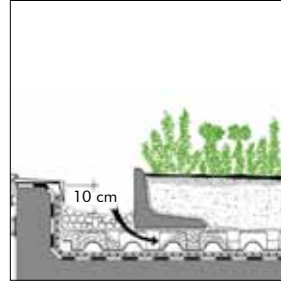
The discharge of rain water on pitched Green Roofs is mainly transferred into gutters. The shear forces, caused by the Green Roof System Build-up need to be diverted into the roof construction either by the slotted Eaves Profile TRP 140 associated with support brackets, or by stable eaves.

Shear Barriers



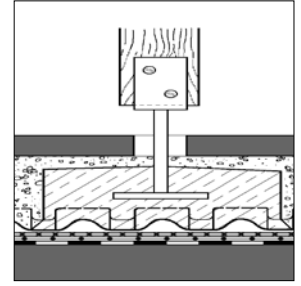
Pitched Green Roofs are often designed right to the edge. Using Shear Fix, waterproofed shear barriers can often be replaced.

Low Profile Roofs



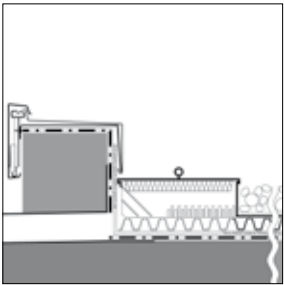
Intensive Green Roofs with higher build-ups can be installed even with low parapets. Concrete L-shaped kerbs or stainless steel profiles are used to border the plant area and allow for greater depth of substrate. They also ensure continuous and effective drainage.

Foundations for Supporting Structures



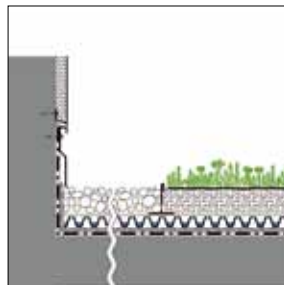
Floradrain® FD 60 can locally be used as formwork if firm foundations are required without penetration of the roof membrane. The channel system on the underside of the element ensures the unimpeded drainage of excess water.

Waterspout with Inspection Chamber



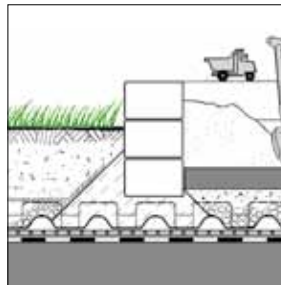
On flat roofs, water can be drained via edge outlets or waterspouts through the parapet. The inspection chamber ensures the accessibility of the outlets at any time, and can be cleaned easily, if necessary.

Wall Connection



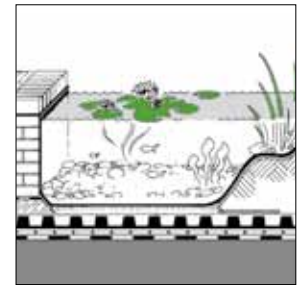
The waterproofing must be taken up on perimeters approx. 150 mm above the finished surface of the roof. The upper edge of the flashing must be protected from rain water, which can be achieved by using the FZ bar, in connection with the Clamping and Protection Profile EP 150.

Play Area



Provided there are safety rails at the perimeters, it is possible to construct playgrounds on roofs with slides and sandpits. Timber planks, for instance, are a suitable border between the sandpit and the planted area. Concrete paving slabs placed at the bottom of the sandpit, above the drainage element, provide an additional protective barrier for the waterproofing and also enable an easy replacement of the sand, if needed.

Ponds and Pools



With the correct design, ponds and pools can also be installed on roof decks. They should be placed above the drainage layer and lined separately with a special plastic membrane. Should the pool ever leak, the water would flow into the regular roof drainage. On high and exposed buildings, it is recommended to have at least a 300 mm higher water level to compensate for the increased evaporation rate.

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.



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