



PLANNING GUIDE

System Solutions for Extensive Green Roofs

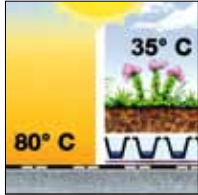
Life on Roofs



Why Have a Green Roof?

Urban, construction and ecological advantages:

Extended Roof Life



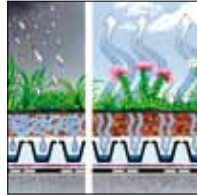
- Protects the roof membrane from UV exposure, heat, cold and hail and mechanical damage.

New Habitat



- Encourages wildlife to remain within build-up areas.

Stormwater Management



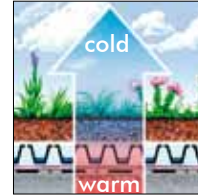
- Reduces immediate water run-off. The sewer pipes can be reduced in capacity.

Reduction of Dust and Smog Levels



- Enhances the micro-climate by cooling, filtering out dust and smog particles.

Improve Building Operations



- Thermal protection in both summer and winter and reduction of heating and cooling costs.

Noise Reduction



- Improves sound insulation.

Features

Unlike intensive green roofs, extensive green roofs require little maintenance.

The features at a glance:

- **Minimum maintenance:**
 - Inspection and maintenance once or twice a year
 - Water and nutrient supply mostly by natural means
- **Plant communities close to nature:**
 - Undemanding
 - Extensive
 - Self-regenerating
- **Low loads and build-up heights:**
 - Mainly mineral growing medias with depths of up to about 5 in.
 - Loads about 20-40 lbs/sq.ft.
- **Low-cost:**
 - For installation and maintenance

Principles

ZinCo extensive green roofs are installed in accordance with current standards.

Our six principles at a glance:

- The System Build-up is tailored to suit each roof.
- The System Build-up ensures permanent drainage, even under load.
- The System Build-up provides for a good water/air balance.
- The System Build-up is adapted to suit the required type of vegetation.
- The System Build-up keeps maintenance and upkeep to a minimum.
- The System Build-up provides for a long green roof life.

All vegetation specific information is based on moderate continental climate. Please contact us for any other climatic condition.



ZinCo Extensive Green Roof Systems



System Build-up "Sedum Carpet"

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on Inverted Roofs

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for Large Industrial Roofs

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Please see our Planning Guides :

- "System Solutions for Sloped Green Roofs"
 - "System Solutions for Intensive Green Roofs"
- for more information.

System Build-up “Sedum Carpet”



“Sedum Carpet” is a shallow, ground-covering extensive green roof type. In moderate climates, it requires approx. 2.5 in. of “Zincblend E” Growing Media. The System Build-up is adapted to the particular roof condition. “Sedum Carpet” is used, when the load bearing capacity of the roof and the expenses for maintenance, are restrictive.

Proven Sedum species, in combination with the appropriate System Build-up, guarantee a long-lasting low maintenance green roof. The plant community “Sedum Carpet” contains various low-growing Sedum species.

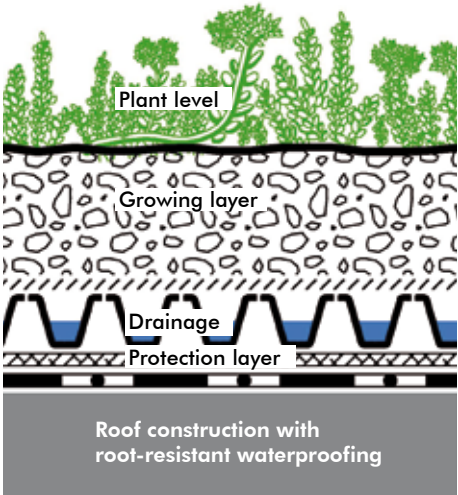
The main blooming time is in early summer, with yellow or red and white flowers dominating at different times. Throughout

the rest of the year, “Sedum Carpet” is represented in various shades of green. Red shades, particularly in autumn, are a pleasant change in the visual appearance. “Sedum Carpet” is installed either by Sedum cuttings or plug plants or pre-cultivated vegetation mats.





Plant Suggestions "Sedum Carpet"				
Minimum of four different Sedum species				
Botanical Name	Common Name	Height (in.)	Blossom Color	Time of Bloom
<i>Sedum album</i> varieties	White Stonecrop Varieties	2-4	white	early mid summer
<i>Sedum caucicolum</i>	Nettle-Leaved Goosefoot	4-6	pink	late summer - early fall
<i>Sedum floriferum</i> 'Weihenstep. Gold'	Gold Sedum	2-4	yellow	early mid summer
<i>Sedum hybridum</i> 'Immergrünchen'	Hybrid Stonecrop	4-6	yellow	mid summer
<i>Sedum reflexum</i>	Crooked Yellow Stonecrop	8-10	yellow	early mid summer
<i>Sedum sexangulare</i>	Tasteless Yellow Stonecrop	2-4	yellow	early mid summer
<i>Sedum spurium</i> in varieties.	Dragon`s Blood	4-6	red, white, pink	mid summer



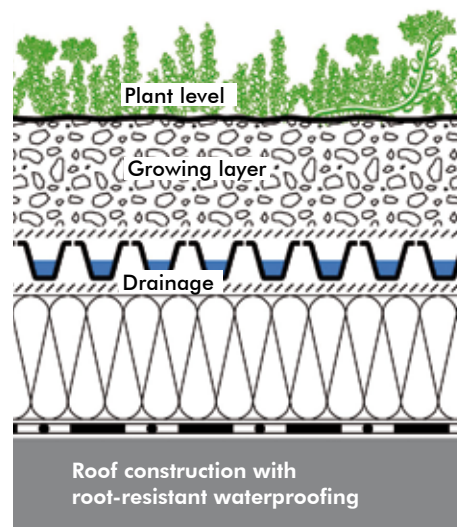
Plant Community "Sedum Carpet"

Growing Media "Zincoblend E",
Depth: ≈ 2.5 in.,
for vegetation mats ≈ 1.5 in.
Filter Sheet SF

Drainage Element Floradrain® FD 25-E
Protection Mat SSM 45
Root Barrier WSF 40 (optional)

Slope:	1/48 – 2/12
Height	≈ 3 ¾ in.
Weight:	≈ 20 lbs/sq. ft.
Water retention capacity:	≈ 0.8 gal/sq. ft.

System Build-up “Sedum Carpet” on Inverted Roofs



Slope:	1/48–2/12
Height	≈ 3 ¾ in.
Weight:	≈ 19 lbs/sq. ft.
Water retention capacity:	≈ 0.7 gal/sq. ft.

Inverted Roof (Slope 1/48–2/12)

Plant Community “Sedum Carpet”

growing media “Zincoblend E”,
Depth: ≈ 2.5 in. (≈ 60 mm),
for vegetation mats ≈ 1.5 in. (≈ 45 mm)
Filter Sheet SF

Drainage Element Floradrain® FD 25-E
Separation Membrane TGV 21

(XPS thermal insulation)

Root Barrier WSF 40 (optional)

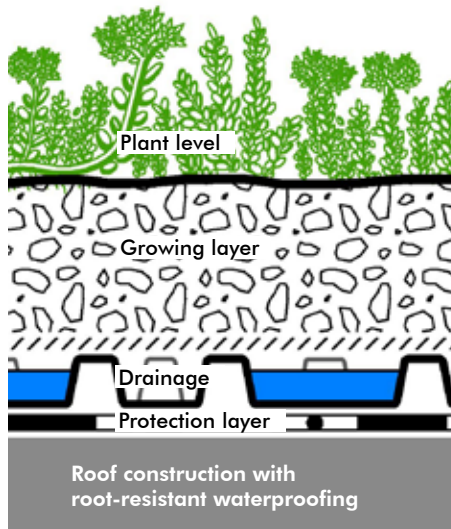


With inverted roofs, layers that prevent the diffusion of water vapor must not be installed above the XPS thermal insulation boards. Therefore, the water retaining protection mat must be replaced by the diffusion permitting Separation Membrane TGV 21. If root barriers are necessary they have to be placed below the insulation boards directly onto the waterproofing.

System Build-up “Sedum Carpet” for Large Industrial Roofs

The bigger the roof area, the higher the costs. You can avoid this by omitting certain layers.

ZinCo has combined a number of functional layers in one product. Fixodrain® XD 20 can be installed without an additional protection layer, due to its extremely large contact surface and continuous connection over a large area. The filter sheet is laminated to the drainage mat, the roll-out takes place quick and easy. The elements are interlocking with an overlapping filter sheet.



Plant Community “Sedum Carpet”

Growing Media “Zincoblend E”,
Depth: ≈ 2.5 in. ,
for vegetation mats ≈ 1.5 in.

Drainage Mat Fixodrain® XD 20

Root Barrier WSF 40 (optional)
covered with Filter Sheet PV

Slope:	1/48–2/12
Height	$\approx 3 \frac{3}{4}$ in.
Weight:	≈ 19 lbs/sq. ft.
Water retention capacity:	≈ 0.7 gal/sq. ft.



System Build-up "Ornamental Sedum"



"Ornamental Sedum" allows for an extensive green roof with sophisticated design and individual character. The growing media is applied with a minimum depth of

2.75 in. "Ornamental Sedum" vegetation consists of a wide variety of species which results in a long blooming period and allows for different accents throughout the vegetation period.

Sedum species and other perennials are primarily used as a ground cover. Drought resistant perennials add flowering accents and height to the design.

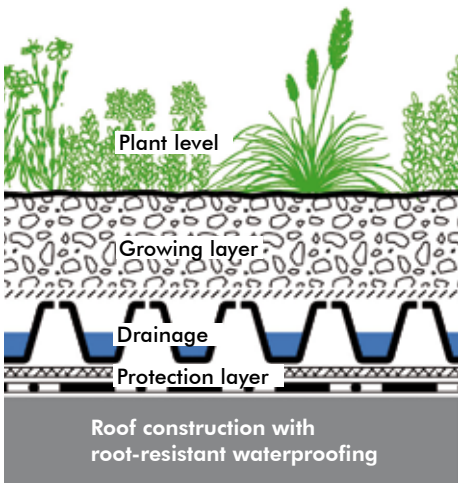


The color spectrum is significantly more diverse in comparison to "Sedum Carpet". The Build-up is realized by manually planting plug plants. Thus the desired result can be designed.





Plant Suggestions "Ornamental Sedum"				
Botanical Name	Common Name	Height (in.)	Blossom Color	Time of Bloom
Accent plants (groups of 3,5, or 7)				
<i>Allium schoenoprasum</i>	Wild Chives	10	pink	late spring
<i>Armeria maritima 'Alba'</i>	White Sea Thrift	6	white	mid spring
<i>Dianthus deltoides 'Brillant'</i>	Maiden Pink	4-6	red	early summer
<i>Saponaria ocymoides</i>	Rock Soapwort	12	pink	early-late summer
<i>Sedum ellacombianum</i>	Orange Stonecrop	4-6	yellow	mid-summer
<i>Sempervivum tectorum 'Emerald Empress'</i>	Common Houseleek	2-4	pink	early-mid summer
<i>Talinum calycinum</i>	Fameflower	10-12	pink	late spring - late summer
Ground covers (Minimum of four different Sedum species)				
<i>Antennaria dioica</i>	Stoloniferous Pussytoes	4	pink	early-mid summer
<i>Delosperma nubigenum "Basutoland"</i>	Ice Plant	2-3	yellow	late spring
<i>Sedum floriferum 'Weihenstephaner Gold'</i>	Gold Sedum	2-4	white	early-mid summer
<i>Sedum hybridum 'Immergruenchen'</i>	Hybrid Stonecrop	4-6	yellow	mid summer
<i>Sedum middendorffianum diffusum</i>	Stonecrop	5	yellow	mid summer
<i>Thymus serpyllum 'Coccineum'</i>	Red Thyme	12	red	early summer
<i>Thymus serpyllum 'Pink Chintz'</i>	Creeping Thyme	12	pink	spring



Plant Community "Ornamental Sedum"

Growing Media "Zincoblend E",
Depth: ≈ 2.75 in.

Filter Sheet SF
Floradrain® FD 40-E

Protection Mat SSM 45
Root Barrier WSF 40 (optional)

Slope:	0/12–2/12
Height	≈ 4 ½ in.
Weight:	≈ 23 lbs/sq. ft.
Water retention capacity:	≈ 1.0 gal/sq. ft.

System Build-up "Solar Green"

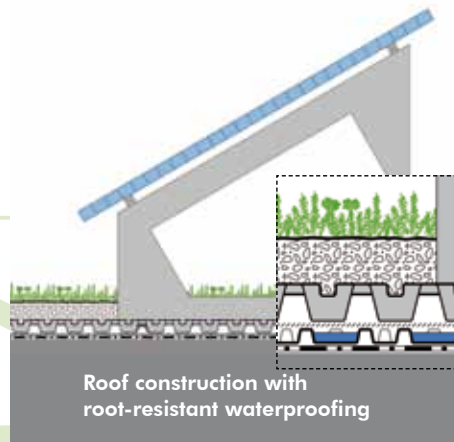


Solar energy and green roofs can now be combined. With our System Build-up "Solar Green" (Fixodrain® XD 20, ZinCo Solar Base SB 200 and Base Frame SGR) solar panels can be combined with a green roof.

Solar panels are more energy efficient with the cooling effects of the Sedum. And, there is no need for roof penetration, because the weight of the green roof build-up ballasts the entire system.

Solar panel

Solar Base Frame SGR



Plant Community "Sedum Carpet"
Growing Media "Zincoblend E"
ZinCo Solar Base® SB 200 with infill
Fixodrain® XD 20
Root Barrier WSF 40 (optional)

Build-up height: from \approx 5 in.
Weight, saturated: from \approx 25 lbs/sq. ft.*
Water storage capacity: from \approx 0.6 gal/sq. ft.*

* The required growing media quantity depends on the project. Thus the total weight can change.



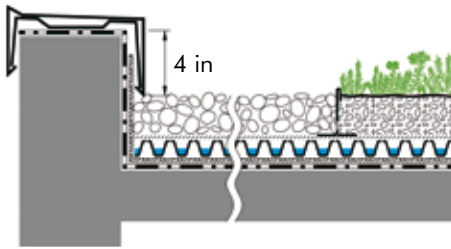
Accessories and Details

Perimeters

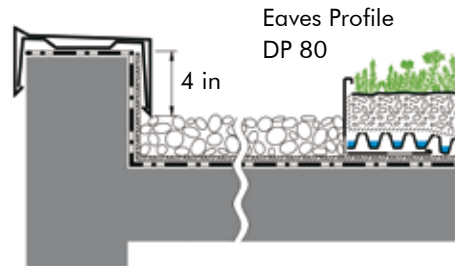
In line with local roofing codes a height of 4 inches above the roof surface is required. The protection mat and root barrier are required to be tucked up under the parapet cap. The protection mat and

root barrier, are brought upwards and secured. If in projects with high wind loads the perimeter and corner areas of the roof are to be part of the green roof,

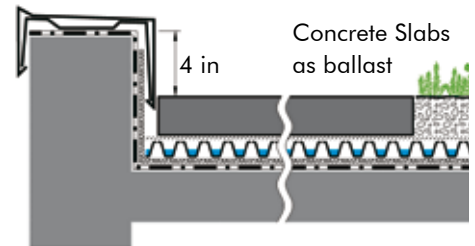
the vegetation cover must be closed immediately, e. g. by using Sedum mats. This is very often done by adding wide edge stripes of concrete or grass pavers.



Standard perimeter solution

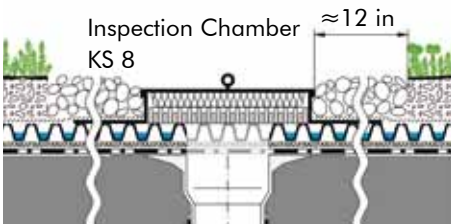


Solution for low perimeters



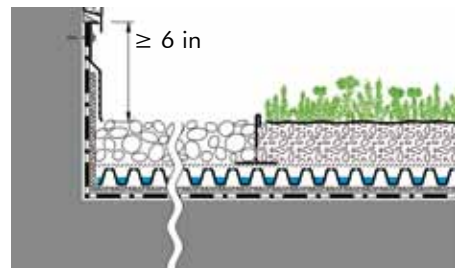
Perimeter solution for high wind loads (loose waterproofing)

Roof Drains and Inspection Chambers

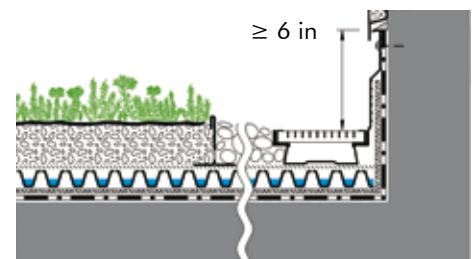


Usually, the drainage of low sloped roofs is achieved through roof drains. The quantity as well as the size of the roof drains should be designed according to local building codes. Inspection chambers make sure the roof drains remain accessible and therefore can be cleaned easily.

Wall Connection



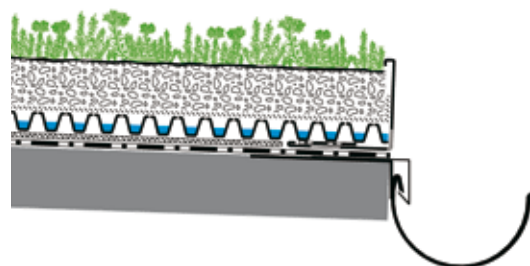
The connection to walls needs to be waterproof. Therefore the protection mat, the waterproofing and the root barrier are taken up at least 6 in above the finished surface of the green roof build-up and fixed with a protection profile. In front of facades the installation of additional drainage channels is recommended



in order to lead rainwater directly into the drainage layer. If only little water is expected, a simple gravel strip is sufficient.

Drainage via an External Eaves Gutter

If the drainage of a green roof is to be ensured by an external gutter, the green roof build-up can be bordered by an eaves profile, which is attached to the waterproofing. Eaves profiles border the build-up but allow for unhindered water runoff due to their drainage slots.



Ecological Green Roof Systems

This Planning Guide aims to give you a general overview of the technology involved in the various extensive green roof options.

Our technical experts will be pleased to advise you on specific solutions for your own individual building projects: from the planning phase right through to creating your specification texts.

Challenge us!



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