Info Sheet
Green Roof Maintenance

Extensive landscapes with wind, frost and drought resistant plants require little maintenance. The better adapted the plants are to their roof conditions, the less maintenance required. Maintenance objectives vary with each case and will depend on the plant types used, their stage of development, the local climate and the specific position and conditions on the roof.

Maintenance objectives depending on vegetation type

ZinCo Plant Community "Sedum Carpet"
The goal is a dense, long-lasting and bio-diverse carpet of sedum plants. Broad-leaved sedum species should constitute the majority. Weeds should be regularly removed.

Strategic use of slow-release fertilizer will strengthen sedum vegetation while limiting moss growth. At least once, safer twice yearly there should be a maintenance and weeding.

ZinCo Plant Communities "Rockery Type Plants" and "Pitched Green Roofs"
Again, the goal is a stable, diverse community of species. Weaker species such as hybrid Sempervivum must be protected from more aggressive species through maintenance.

Self-seeding species such as some grasses must be pruned regularly to avoid overpopulation. Weeds and unwanted pioneers should also be regularly controlled.

Maintenance should occur 2-3 times annually. On flat roofs, additional watering may be necessary during drought. Pitched and steep roofs may sometimes need more frequent watering, especially on south exposed surfaces. Proper fertilization on pitched roofs is important for establishing good cover and thus erosion control.

Wildflowers, herbs, grasses
Wildflowers and herbs:
The highest possible biodiversity should be sought. Aggressive species may need to be isolated and regularly cut back. Sprouting trees and other unwanted plants should be removed regularly.

Grass roofs or grass - wildflower Mixtures:
The aim here is a low-maintenance dry meadow.
Mowing can be conducted every 1-3 years, or more depending on desired appearance. Cuttings should be removed.

Maintenance objectives depending on the stage of development

Completion Care as integral part of the

installation

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Successful installation - seeding, Sedum cuttings, plug planting.

Requirements: 60% surface coverage (with Sedum cuttings it must be at least 4 species, each 15%); at least 80% of the advertised species must be present and growing; max. 20% of total covered by foreign species; must have experienced one full growing and rest cycle (lasting dry or frost).

Successful installation – pre-cultivated vegetation mats or elements.

Vegetation mats must have established and secure root systems. There must be 90% cover by the advertised vegetation for acceptance. A maximum of 10% of the joints may be visible. Vegetation mats with wild flowers, herbs and grasses may contain a maximum 20% suitable species;. Sedum vegetation mats should not contain any foreign vegetation.

Development Care

Directly after handing over the project, a 2 year maintenance period will begin. The goal is a permanently functioning green roof with a surface cover of at least 90% and a species composition in accordance with the plant lists.
There are usually required 2 to 3 maintenance rounds per year. For this purpose, a maintenance contract should be struck with a specialist company.

Maintenance Care
Here it is important to preserve a functional state, the area coverage and possibly regulatory action.

Maintenance care belongs in the hands of skilled personnel.

2 to 3 maintenance rounds per year are recommended. The client may agree to a single annual maintenance in the case of sedum roofs and simple grass roofs.

"Starving" Sedum vegetation

The same surface after appropriate fertilization

Description of steps

Fertilization
For initial and subsequent fertilization, the FLL Guideline recommends a coated NPK slow-release fertilizer at a rate of 5 g N/m² FLL-Guidelines for the Planning, Construction and Maintenance of Green Roofing, 2008. For example a coated NPK long-term fertilizer 23-5-10 with a residual effect of about 4 months can be used. The ideal time for fertilization is March to mid-June. If necessary, fertilizing later in the vegetation period can be conducted with a slow-release lawn fertilizer. Fertilizing should not occur in the rest period.

Recommendations for initial fertilization
When planting in mid-March to mid-June: coated NPK long-term fertilizer 23-5-10, 25 g/m².
When planting in late June to mid-September:
slow release lawn fertilizer NPK 20-5-8, 10 g/m²
Greening mid-September to February: start fertilization in early spring.

Recommendations for subsequent fertilization
Every 2-3 years – coated NPK long-term fertilizer 23-5-10, 25 g/m².

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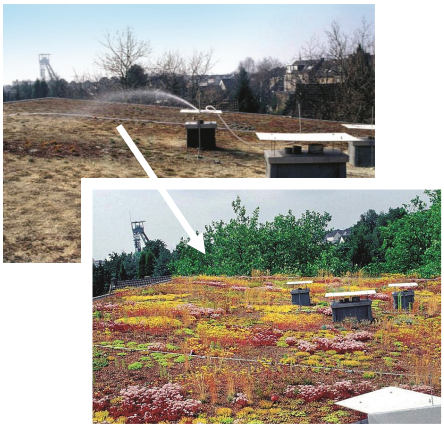
Irrigation
For temporary overhead irrigation and for emergency irrigation a water connection with a sufficient water pressure should be provided for any extensive green roof project.



Initial irrigation
A thorough irrigation after planting is always necessary. Other early irrigations are required depending on the weather. We recommend the use of an automated irrigation for the initial period.

Duration
Planting – 3 to 4 weeks
Vegetation mats – 4 to 5 weeks
Seeding – 6 to 8 weeks (avoid any drying out after germination)

Irrigation in intervals
As long as the vegetation is not yet closed, evaporation losses from the substrate will occur. It is possible that rooting is not yet complete. Watering in intervals can be necessary until handover, especially in areas with low amounts of precipitation or during periods of draught.

Emergency irrigation
A green roof should also be watered long-term (except sedum plantings in climatically favourable regions)
Permanent irrigation installation can be useful, especially for pitched roofs > 20 ° and for roofs in hot, dry climates.

Removal of undesired vegetation
Weeds do not only disturb with the desired appearance of the roof. They also compete with the intended vegetation for nutrients and water and therefore interfere with the development of a healthy green roof. The first step towards preventing weeds is the use of a sterile growing medium. However, weeds can also be introduced by birds or wind. Due to the exposed state of the substrate during the establishment phase, weeding is especially important at that time. If undesired species are removed by their roots regularly and on time before they produce seeds or cover large areas, the total effort can be kept low. Usually 2-3 maintenance rounds per year until handover, and once annually thereafter is required for extensive green roofs. More frequent weeding may be necessary depending on the project, for example in extremely windy locations or near a forest.

Clover

Tree seedlings

Mowing
Grass roof:
A shallow trimming after the emergence of grasses can be beneficial to their development, while upsetting potential weeds.

All seeding varieties:
A clean cut every 2-3 years promotes biodiversity. More frequent mowing can be agreed for optical reasons. Cut grass must be removed.

Levelling after frost-heave
Plantings in autumn or early winter sometimes have insufficient time to root.

Therefore, conduct a temper rolling in the spring or in accordance with frost-free weather to level the vegetation and avoid desiccation.

Rework joints in vegetation mats
Joints in vegetation mats always occur to some degree. A reworking is necessary for a good appearance. On pitched roofs erosion must be avoided. As remedy, additional substrate and vegetation can be introduced to match the vegetation mats.

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Maintenance of security and fire protection strips
These areas should be cleaned regularly and kept free of vegetation.

Erosion Control
Erosion control during installation and maintenance is particularly important, especially in pitched roofs. Wind uplift must also be controlled. For example, an adhesive may be used again after hydro seeding. Stones can be used to secure mats until roots have formed. Long term, full vegetative coverage is key to avoiding erosion. This may require reseeding or replanting.

Control of irrigation and drainage facilities
Drains and drainage systems must be kept clean, clear of obstructions and free-flowing. Optionally installed irrigation systems must also be kept in good working order.

Example of typical steps

Typical tasks for the different stages include, but are not limited to, the following:

Maintenance measure	CC	DC	MC
Initial fertilization			
Development and maintenance fertilizing			
Initial watering			
Interval watering			
Emergency watering			
Removing unwanted foreign growth			
Mowing			
Pruning			
Levelling after frost-heave			
Rework joints			
Reseeding/replanting			
Maintenance of security and fire protection strips			
Erosion prevention			
Control of irrigation and drainage facilities			

CC = Completion Care DC = Development Care MC = Maintenance Care

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