

Specification Suggestion "Steep Sloping Meadow" with Georaster®

SPEC NOTE:

This guide specification gives general information about the ZinCo green roof assembly. It has to be clear, that the information that is shown must be understood as guide and recommendations.

It is possible that your green roof project need special technical requirements. Please contact us for further information regarding technical advice, specifications and budget cost.

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PART 1 – GENERAL

TECHNICAL DATA

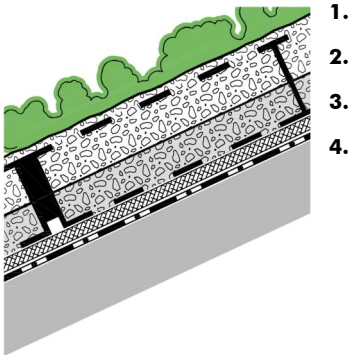
Depth:
120 mm (5")

Saturated weight:
150 kg/m² (30 lbs/ft²)

Water retention capacity:
57 L/m²

Slope:
25-45 degrees

SECTION



Section includes:

1. Plant Community: "Pitched Sedum"
2. Growing Medium ZinCo Blend-SI.
Depth: 110 mm (4.5")
3. Drainage Element ZinCo Georaster®
4. Protection Mat ZinCo WSM 150.
5. Related Materials:
 - ZinCo eaves profile TRP 140
 - ZinCo heavy duty eaves profile TRP 80
 - ZinCo support bracket TSH 60 or TSH 100
 - ZinCo shear fix bracket LF 300
 - Inspection Chamber RKS 75
 - Gravel Strip

REFERENCES

- The ZinCo "Steep Sloping Meadow" assembly meets or exceed the requirements of the FLL-standards (Guideline for Planning, Execution and Upkeep of Green-Roof Sites, Release 2008).

DEFINITIONS

- **Green Roof:** A Green Roof is an innovative, multi-layered system that covers all types of waterproofed roof surfaces with growing medium and plant material.
- **Extensive Green Roof:** A vegetated ecological protection that is light weight, has a low growing medium depth, has a natural/native plant selection, and has low maintenance and low installation costs.
- **Sedum:** Sedum is a large and diverse group of durable Green Roof plants known for its fleshy succulent foliage and stalks of yellow, pink or white flowers. Sedum is very easy to care for, low maintenance plants and once established are drought tolerant.
- **Pitched Roof:** An inclined roof surface that is greater than 2/12 (9°) that is subject

to shear forces not present in flat roof conditions. For pitched roofs, additional measures are required to ensure the stability of the green roof.

SUBMITTALS

- Submit signed shop drawings showing that the roofing system, green roof assembly, materials, perimeter and penetration details and fall protection are accepted by the green roof manufacturer to ensure that the green roof assembly meets the necessary performance requirements.
- Submit a certification showing that all the components of the green roof assembly are supplied and warranted by the green roof manufacturer.
- Submit an inspection report, signed by the roof contractor and the green roof contractor, resulting from the quality control of the roofing system installation prior to the installation of the green roof assembly indicating that the roofing system is installed correctly.
- Submit references which indicate that the green roof manufacturer as well as the green roof contractor has recently successfully completed projects of similar scope and nature.

QUALITY ASSURANCE

- **Installers Qualifications:** Work of this section shall be installed by a recognized green roof or landscape contractor, approved by ZinCo Canada Inc. The contractor shall have adequate equipment, skilled workers with extensive practical experience, skills and knowledge of plants horticulture techniques and overall landscape design requirements.
- Roof details such as flashing, roof edges, roof penetrations, outlets, roof fall and type of insulation must be adjusted to the Green Roof System used. ZinCo Canada

Specification Suggestion “Steep Sloping Meadow” with Georaster ®

Inc. provides consultation and engineering to (landscape) architects, roof contractors and green roof contractors to finalize these adjustments before construction of the roof commences, if requested.

- Prior to the installation of the green roof assembly, test the water tightness of the roofing system by flood testing for at least a 48 hour period or an electronic leak detection process performed by a qualified testing agency.
- Submit documentation certifying that the load bearing capacity of the roof and building construction is tested and approved by a structural engineer, with regard to the extra weight of the Green Roof assembly.

ENVIRONMENTAL CONDITIONS

- The plant community should be chosen in consideration of the climatic circumstances and hardiness zone. Please contact ZinCo Canada Inc. for more information.
- Proceed with planting between spring and early fall so as to enable plants to take root in order to survive the winter months.
- Provide a temporary fall protection (safety railing or fall arrest) during the installation to ensure a safe and healthy work environment.
- Provide a permanent fall protection (safety railing or fall arrest) for maintenance to ensure a safe and healthy work environment.

DELIVERY, STORAGE & HANDLING

- By storage on the roof makes sure that the load of the materials does not exceed the load bearing capacity of the roof and building construction

- Store the materials in a dry area, out of direct sunlight, protected from freezing, staining or damage.
- Stored plant materials have to be watched carefully. Watering the plants can be necessary during a long storage period.

WARRANTY

- Submit a 5-year product manufacturing warranty according to the specifications of the green roof manufacturer which warrants all the components of the green roof assembly. (except the vegetation)
- Submit a 2-year workmanship warranty which warrants the installation of the green roof system according to the specifications.
- Submit a 2 year growing warranty to take effect immediately after the installation of the Green Roof. This warranty is to ensure that the vegetation properly encloses the roof area. After that a maintenance program has to be covering the full period of the warranty.

MAINTENANCE

- Provide a maintenance program for the duration of two growing seasons as per following maintenance measures:
 - Four visits in the first year.
 - Four visits in the second year.
 - The removal of coarse and unwanted weeds and the seedlings of trees; some 'newcomers' are quite acceptable.
 - The removal of vegetation from the gravel strips;
 - Visual inspection of the drain outlets; Maintaining a functioning drainage layer is critical to the establishment of the vegetation. Retained water will stagnate and is detrimental to proper plant growth;

- Fertilizing the vegetation with a slow released chemical fertilizer;
 - type of fertilizer: slow release N-P-K: 20-6-11 75 % coated
 - recommended quantity: 25 gram per square .meter.
- Replace plant material that dies, as necessary;
- Irrigation if necessary;

Submit maintenance report to the owner at the end of the growing season.

PART 2 - PRODUCTS

Specified green roof assembly:
ZinCo Georaster ®: Steep Sloping Meadow

Supplier:

ZinCo Canada Inc.
P.O. Box 29
Carlisle, ON Canada, L0R 1H0

Phone: 905-690-1661
E-mail: greenroof@zinco.ca
Website: www.zinco.ca

1. SEPARATION/PROTECTIVE LAYER

- **ZinCo moisture retention and protection mat WSM 150** made of non-rotting fibers, penetration resistance, for water- and nutrient retention as well as protection layer. Thickness: 20 mm. Weight approx. 1500 g/m². Water retention capacity: 12 l/m². Bitumen resistant – Biologically and Chemically neutral.

2. DRAINAGE – ANTI SLIPPAGE LAYER

- **Drainage and anti-slippage element ZinCo Georaster** made of polyethylene (HD-PE) including a reinforced T-profile in the middle to provide a secure hold for the growing medium against water and wind erosion. Height 100 mm. Weight: approx. 1.8



Specification Suggestion “Steep Sloping Meadow” with Georaster ®

kg/piece. Quantity: 2.56 pc/m².
Dimensions: 540 mm x 540 mm.

3 x 4 cm. Used against wind-, and water erosion. Weight: approx. 500 g/m²

Height: 140 mm.

3. GROWING MEDIUM

- **Growing medium for semi-intensive Green Roofs - ZinCo Blend-SI**, produced using light weight recycled or re-used materials and minerals, enriched with high quality compost elements, resistant to flying sparks, frost-resistant, stable structure. Specially engineered by ZinCo Canada and meets the FLL-Standards for Planning, Execution and Upkeep of Green Roof sites. Depth: 110 mm.

Particle Size Distribution

Proportion of silting components (d < 0.063 mm):
≤ 15 Mass %

Density Measurements

Bulk Density (at max. water-holding capacity): 1100 – 1500 kg/m³
Compression Factor: <20% Vol. %

Water/Air Measurements

Total Pore Volume: ≥ 65 Vol. %

Maximum water-holding capacity: ≥ 35% Vol. %

Air-filled porosity at max water-holding: ≥ 10Vol. %

Water permeability (saturated hydraulic conductivity):
≥ 0.007 cm/sec

pH

6.5 – 9.5

Organic Measurements

Organic matter content: ≤ 8% mass%

Nutrients

Phosphorus, P205 (CAL): ≤ 200mg/L

Potassium, K2O (CAL): ≤ 700mg/L

Magnesium, Mg (CaCl2): ≥ 200mg/L

Nitrate + Ammonium (CaCl2): ≤ 80mg/L

4. ANTI_EROSION NETTING

- **ZinCo anti-erosion netting JEG** made of 100% jute, biodegradable, mesh width

5. PLANT MATERIAL

(PLEASE CHOOSE ONE OF THE PLANTING OPTIONS)

PLUG PLANTS

- **Plug plants:** Plant material potted in 50 or 72 tray plugs in a mix of Sedums, Grasses and Herbs. Quantity: at 16 plants/m² or 18 plants/m² or 20 plants/m².

(PLEASE CHOOSE REQUIRED PLANT DENSITY)

PRE-GROWN VEGETATION MATS

- **Pre-cultivated Vegetation Mats** with firmly rooted, for extensive green roofs suitable plant species, pre-cultivated over one growing season in the field. The carrier material decomposes after time. Delivery weight: approx. 16–20 kg/m² (3-5 lbs/ft²). Height: ca. 20–25 mm (0.75 - 1 inch) Supplying quantity: minimum 2.00 m². Standard dimensions: ca. 1.20 m x 2.00 m. On request also mats in other dimensions or with non-decaying carriers are available.

Plant types:

The basis vegetation mats are 12–14 adapted Sedum types, e.g. Sedum album, Sedum acre, Sedum spurium, Sedum floriferum, Sedum kamschaticum, Sedum reflexum, Sedum sexangulare, and Sedum hybridum. Various herbs and grasses are also available for extensive green roofs.

The coverage is at least 85% when shipped.

6. RELATED PRODUCTS

- **ZinCo heavy duty eaves profile TRP 140** made of stainless steel L-bracket. Including vertical slots for drainage and attached butt joints. Length: approx. 3 m.

- **ZinCo shear barrier TRP 80** made of stainless steel L-bracket. Including vertical slots for drainage and attached butt joints. Length: approx. 3 m. Height: 140 mm.

- **ZinCo support bracket TSH 60 or TSH 100** made of stainless steel. Maximum load per bracket: TSH 60: 150 kg – TSH 100: 300 kg. Length: approx 40 cm. Including 3 - 8 mm screw holes.

- **ZinCo shear fix bracket LF 300** made of solid stainless steel 5 x 50 mm for use on sealed, sloped roof areas to prevent the green roof assembly from slipping. Maximum load per bracket: 300 kg. Length: approx 40 cm. Including 5 - 8 mm screw holes.

- **ZinCo inspection chamber SKS 12** (Optional by use of normal parapet with roof drains or waterspouts) made of coated steel sheet metal with thermally insulated cover to ensure accessibility of the outlets at any time. Resistant to compression. Height: 12 cm.

- **Gravel strip** to protect roofing details, using a 1”-2” round aggregate. Width: at least 30 cm. Depth: 80 or 100 mm.

(PLEASE CHOOSE REQUIRED DEPTH)

PART 3 – EXECUTION

1. INSPECTION

- Clean up the waterproofing membrane carefully (well-swept)
- Careful inspection of the waterproofing membrane including seams, penetrations and details after flood testing or electronic leak detection. If the waterproofing system and the Green Roof system are not carried out by the same company, the acceptance of the method used for waterproofing quality should be agreed by all the parties. Identified defects are to be reported in written form. Do not proceed until



corrected.

2. SEPARATION / PROTECTIVE LAYER

- Deliver and install the **ZinCo protection mat WSM 150** directly on the top of waterproofing membrane with a minimum overlap of 100 mm, according to the manufacturer's instructions. The protection mat has to be taken above the growing medium along the edges and roof penetrations. Cut the protection mat in place at the roof penetrations.

3. DRAINAGE – ANTI SLIPPAGE LAYER

- Deliver and install the **ZinCo Georaster** elements directly on the protection mat according to the manufacturer's instructions. Connect the elements with the connectors on the outside of the elements. Cut the drain elements in place along the edges and roof penetrations.

4. GROWING MEDIUM

- Deliver and install the **growing medium for extensive Green Roofs ZinCo Blend-SI** in the drainage and anti-slippage element. Spread out the growing medium equally to a depth of 110 mm. Check the depth on several places to ensure the right thickness. A tolerance of 1 cm is acceptable. Small amounts of growing medium will be delivered in big bags. Larger amounts will be delivered by a blower truck.

5. ANTI-EROSION NETTING

- Deliver and install the **ZinCo Anti-erosion netting JEG** in the growing medium so that 10-20 mm of growing medium is situated above the net.

6. PLANT MATERIAL

(PLEASE CHOOSE ONE OF THE PLANTING OPTIONS)

- Deliver and install the plant material in the growing medium according to the planting design and plant lists. Including one watering right after the installation.

PLUG PLANTS:

Take the plugs out of the plant trays and lay them out on the growing medium following the planting design. Dig a hole, the size of root ball and apply the plug in the hole. Cover the root ball with growing medium and compact it gently in place. Water the plugs right after the installation.

PRE-GROWN VEGETATION MAT:

Install mats same day as the delivery. Do not store without permission of the grower. Do not place in full sun. During hot sunny days water/cool of the soil layer with 15-25 minutes of pre-watering. Hot scorching soil burns the roots and might damage the Sedum mats.

Starting in the corner, carefully place each roll at location and unroll the mats over the entire roof area. Make sure that the mats are in contact with the growing medium. Water immediately for 30-60 minutes after installation.

After installation: Water the first month according to the grower's specification depending on the season and time of year using automatic timers.

7. RELATED PRODUCTS

- **ZinCo heavy duty eaves profile TRP 140** Deliver and install the ZinCo heavy duty eaves profile at the bottom of the roof construction, loose laid on top of the membrane and against the ZinCo support bracket. Cut the elements in length and connect them with the available joint connectors.

In combination with:

- **ZinCo support bracket TSH 60 or TSH 100** Deliver and install the ZinCo support brackets at the necessary positions following the manufactures instructions. Fasten the brackets with flat head tapcon screws (7 mm x 82 mm) through the membrane into the roof construction. Seal the bracket with a (200 mm wide) flashing strip of the available roofing membrane.

- **ZinCo heavy duty eaves profile TRP 80** Deliver and install the ZinCo heavy duty eaves profile at the bottom of the roof construction, loose laid on top of the membrane and against the ZinCo support bracket. Cut the elements in length and connect them with the available joint connectors.

In combination with:

- **ZinCo shear fix bracket LF 300** Deliver and install the ZinCo shear fix brackets at the necessary positions following the manufactures instructions. Fasten the brackets with flat head tapcon screws (7 mm x 82 mm) through the membrane into the roof construction. Seal the bracket with a (200 mm wide) flashing strip of the available roofing membrane.

- **ZinCo inspection chamber SKS 212** Deliver and install the ZinCo Inspection Chamber on top of the drainage layer above the roof outlets or in front of a scupper following the manufacturer's instructions.

- **Gravel strip**

Deliver and install a gravel strip along roof edges, flashing details and roof penetrations using a 1"-2" round aggregate. Depth: 80 mm.

8. COMPLETION

- Upon completion, water the plant material and leave the site in a neat, clean and workmanlike condition.



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9. MAINTENANCE

- Execute the maintenance program as described on page 2.

END OF SECTION

