

Specification Suggestion

“Sedum Roof Plus” with Floradrain® FD 25-E

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 -140 mm (5"-6")

Saturated weight:

130 - 155 kg/m² (27 – 32 lbs/ft²)

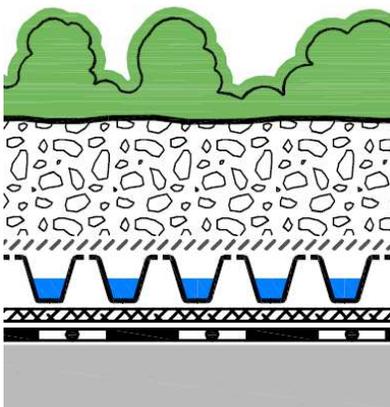
Water retention capacity:

44 - 51 L/m²

Slope:

2-5 degrees

SECTION



Section includes:

1. Plant Community: “Sedum Roof Plus”
2. Growing Medium ZinCo Blend-E.
Depth: 100 or 120 mm (3.0 or 4.0”)
3. a. Filter Sheet ZinCo SF
b. Aquafleece AF300
4. Drainage Element ZinCo Floradrain® FD 25
5. Protection Mat ZinCo SSM45
6. Related Materials:
 - ZinCo Root Barrier WSF40
 - Inspection Chamber ZinCo KS10
 - Gravel Retain ZinCo KL100/120
 - Gravel Strip
 - ZinCo Irrigation Unit BM4

REFERENCES

- The ZinCo “Sedum Roof” assembly meets or exceed the requirements of the FLL-standards (Guideline for Planning, Execution and Upkeep of Green-Roof Sites, Release 2008).
- The ZinCo “Sedum Roof” meets or exceed the Toronto Green Roof Construction Standard (Toronto Municipal Code Chapter 492, Article IV).

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.

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 system 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 Assembly used. ZinCo Canada Inc. provides consultation and engineering to (landscape) architects, roof contractors and green roof contractors to finalize these adjustments before

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construction of the roof commences, if requested.

- Prior to the installation of the green roof system, 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 10-year (insurance backed) 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;
 - Soil Testing & 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. Soil testing may be required.

- Replace plant material that dies, as necessary;
- Replace lost growing medium from erosion through foot traffic, wind damage, or nesting animals. Use ZinCo growing medium.
- Removal of unwanted debris to ensure no damage to the vegetation.
- Irrigation if necessary;

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

PART 2 - PRODUCTS

Specified green roof assembly:
ZinCo Floradrain ® FD25: Sedum Roof Plus

Supplier:

ZinCo Canada Inc.
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Website: www.zinco.ca

1. ROOT BARRIER

- **ZinCo root barrier WSF 40** (Optional item if non root-resistant is waterproofing used.) made of special-polyethylene – Bitumen and Polystyrol resistant - Without plasticizer - UV-stabilized. Thickness: 0,38 mm. Weight: 320 g/m². Tensile strength: 40 – 47 N/mm². Density: 940 kg/m³.

2. SEPARATION/PROTECTIVE LAYER

(PLEASE CHOOSE CONVENTIONAL OR INVERTED ASSEMBLY)

(CONVENTIONAL ROOF ASSEMBLY)

- **ZinCo moisture retention and protection mat SSM45** made of recycled non-rotting fibers for water- and nutrient retention as well as a protection layer. Thickness: 5 mm. Weight approx.



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470 g/m². Water retention capacity: 5 l/m². Bitumen resistant – Biologically and Chemically neutral. Penetration resistance: > 2000 N. Tensile strength length wise: >8.5 KN/m.

Or

(INVERTED ROOF ASSEMBLY)

- Air and vapour permeable membrane **ZinCo diffusion membrane TGV21** made of thermal consolidated Polypropylene. Bitumen resistant – Biologically and Chemically neutral. Vapour opening size $S_d \leq 0,01$ m) Thickness: 0,55 mm. Weight: 80 g/m². To be used as separation layer on inverted roofs and protection against small particle infiltration.

3. DRAINAGE – WATER STORAGE LAYER

- **ZinCo Drainage and water storage element Floradrain® FD25-E** made of 100% thermoformed recycled polyethylene, with water storage cells, openings for aeration and diffusion as well as a multidirectional drainage channel system on the underside. Bitumen resistant – Compressive strength: 270 kN/m². Water retention capacity: 3 l/m². Weight: approx. 1,7 kg/m². Dimensions: 1.00 x 2.00 x 0.025 m.

4. FILTER LAYER (UNIRRIGATED)

(PLEASE CHOOSE IRRIGATED OR NON-IRRIGATED ASSEMBLY)

(NON IRRIGATED ASSEMBLY)

- **ZinCo Filter Sheet SF** made of non-rotting thermal consolidated Polypropylene. Water flow rate: 70 l/(m²s) if there is a water column of 100 mm. Apparent Opening size: $d_{90\%} = 95 \mu\text{m}$. Weight: 100 g/m².

Or

(IRRIGATED ASSEMBLY)

- Highly efficient irrigation fleece **ZinCo Aquafleec AF300** made of polyacrylic fibers, attached to tear-resistant woven fabric made of PP, for its use in irrigated extensive green roof build-ups. Water flow rate: 20 L/(m²s). Water Retention Capacity 3-4 L/m². Thickness: 2.4 mm. Weight: 300 g/m².

5. GROWING MEDIUM

- **Growing medium for extensive Green Roofs - ZinCo Blend-E**, 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: 100 or 120 mm.

(PLEASE CHOOSE REQUIRED DEPTH)

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: ≥ 10 Vol. %

Water permeability (saturated hydraulic conductivity):
 ≥ 0.001 cm/sec

pH

6.5 – 9.5

Organic Measurements

Organic matter content: $\leq 8\%$ mass%

Nutrients

Phosphorus, P205 (CAL): ≤ 200 mg/L

Potassium, K2O (CAL): ≤ 700 mg/L

Magnesium, Mg (CaCl2): ≥ 200 mg/L

Nitrate + Ammonium (CaCl2): ≤ 80 mg/L

6. PLANT MATERIAL

(PLEASE CHOOSE ONE OF THE PLANTING OPTIONS)

SEDUM CUTTINGS

- **Sedum cuttings** shall be harvested from healthy, vigorous plants while in a vegetative growth mode. They shall range in length from 1/2” to 3” and possess sufficient rooting nodes to allow for rapid root development once sown.

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



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Sedum hybridum. Various herbs and grasses are also available for extensive green roofs.

The coverage is at least 85% when shipped.

7. RELATED PRODUCTS

- **ZinCo inspection chamber KS 10** made of plastic coated galvanized steel with thermally insulated cover, resistant to compression. Height: 60 mm. To ensure accessibility of the roof drains at any time. Dimensions: 0.25 x 0.25 x 0.10 m. Weight: 3 kg.

- **ZinCo gravel retainer KL100/120** made of aluminum L-bracket with square slots for drainage. Designed as gravel retainer for gravel strips. Length: approx. 3 m. Height: 100 mm or 120 mm. Including joint connectors.

(PLEASE CHOOSE REQUIRED HEIGHT)

- **Gravel strip** to protect roofing details, using a 1"-2" round aggregate. Width: at least 30 cm. Depth: 100 or 120 mm.

(PLEASE CHOOSE REQUIRED DEPTH)

- Pre-assembled **Irrigation unit ZinCo BM4** in lockable stainless steel box for outdoor use for automated irrigation of green roofs. Contains: connection for water supply line 32 mm, filter, pressure regulator, connection for garden hose, irrigation time controller (with 9V battery, therefore no power supply required), 4 magnetic valves 1" including connectors for 32 mm tube and rain sensor. To be used in combination with Aquafleece AF300 and driplines.

- **ZinCo irrigation dripline 500-L2** in combination with the water distribution fleece AF300. Outer diameter: ca. 16 mm, with inside placed drippers, dripper spacings 100 mm, dripper capacity ca. 1 l/h, pressure-compensating.

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. ROOT BARRIER

- Deliver and install the **ZinCo root barrier WSF40** on top of the non root-resistant waterproofing with a minimum overlap of 500 mm according to the manufacturer's instructions. The root barrier must be installed above the growing medium along the edges and roof penetrations.

3. SEPARATION / PROTECTIVE LAYER

(PLEASE CHOOSE CONVENTIONAL OR INVERTED ASSEMBLY)

(CONVENTIONAL ROOF ASSEMBLY)

Deliver and install the **ZinCo moisture retention and protection mat SSM45** directly on the top of the root barrier with a minimum overlap of 100 mm, according to the manufacturer's instructions. The separation sheet must be installed above the growing medium along the edges and at roof penetrations.

Or

(INVERTED ROOF ASSEMBLY)

- In the case of an inverted roof: Deliver and install the **ZinCo diffusion membrane TGV21** directly on the top of the insulation with a minimum overlap of 100 mm, according to the manufacturer's instructions. The separation sheet must be installed above the growing medium along the edges and at roof penetrations.

4. DRAINAGE & WATER STORAGE LAYER

- Deliver and install the **ZinCo Drainage and water storage element Floradrain® FD25-E** directly on the protection mat or diffusion membrane according to the manufacturer's instructions. Install the Floradrain elements butt jointed with the evaporation holes facing up and. Cut the drain elements in place along the edges and roof penetrations. Fill the water retention cups of the drain layer once with water.

5. FILTER SHEET

(PLEASE CHOOSE IRRIGATED OR NON-IRRIGATED ASSEMBLY)

- Deliver and install the **ZinCo filter sheet SF** on the drainage layer with a minimum overlap of 100 mm according to the manufacturer's instructions. The filter must be installed above the growing medium along the edges and roof penetrations. Cut the filter sheet in place along the edges and at roof penetrations.

Or

- Deliver and install the **ZinCo Aquafleece AF300** on the drainage layer with a minimum overlap of 100 mm according to the manufacturer's instructions. The fleece must be installed above the growing medium along the edges and roof penetrations. Cut the fleece sheet in place along the edges and at roof penetrations.



6. GROWING MEDIUM

- Deliver and install the **growing medium for extensive Green Roofs ZinCo Blend-E** on the filter sheet or Aqua fleece. Spread out the growing medium equally to a depth of 100 mm or 120 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.

7. 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.

SEDUM CUTTINGS:

Spread the sedum cuttings out over the growing medium at the recommended rate and apply them in the top 20 mm of the growing medium by raking. Cover the cuttings with a thin layer (10 mm) of compost mulch. Water the cuttings 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.

8. RELATED PRODUCTS

- **ZinCo inspection chamber KS 10**
Deliver and install the ZinCo Inspection Chamber on top of the drainage layer above the roof outlets. Install the ZinCo filter sheet SF on the flange of the inspection chamber.
- **ZinCo gravel retainer KL100/120.**
Deliver and install the ZinCo gravel retainer on top of the filter fabric between the gravel strip and the growing medium.
- **Gravel strip**
Deliver and install a gravel strip along roof edges, flashing details and roof penetrations using a 1"-2" round aggregate. Depth: 100 or 120 mm.
- **ZinCo Irrigation Unit BM4**
Deliver and install ZinCo irrigation unit at the appropriate location on the roof. Hook up waterline and driplines and program the controller to the required settings.
- **ZinCo Dripline 500-L2**
Deliver and install ZinCo Dripline irrigation on top of the Aquafleece AF300. Fasten the dripline to the Aquafleece using velcro strips.

9. COMPLETION

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

10. MAINTENANCE

- Execute the maintenance program as described on page 2.

END OF SECTION