

Specification Suggestion

“Lightweight Lawn” with Aquatec® AT 45

SPEC NOTE:

This guide specification gives general information about the ZinCo green roof systems. 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:

>150 mm (>6")

Saturated weight:

>165 kg/m² (>34 lbs/ft²)

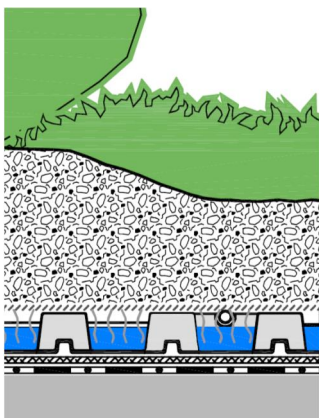
Water retention capacity:

>66 L/m²

Slope:

2-5 degrees

SECTION



Section includes:

1. Plant Community: “Meadow” or “Lawn”
2. Growing Medium ZinCo Blend-SI.
Depth: >100 mm (> 4.0")
3. Wicking Mat ZinCo DV 40.
4. Drainage Element ZinCo Aquatec® AT 45
5. Protection Mat ZinCo TSM 32
6. Related Materials:
 - ZinCo Root Barrier WSF40
 - Inspection Chamber KS10.
 - Gravel Retain KL100/120.
 - Drip line ZinCo 100 L-1.
 - Irrigation control unit ZinCo BM 4.
 - Gravel Strip.

REFERENCES

- The ZinCo “Lightweight Lawn” 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.
- **Semi-Intensive Green Roof:** A semi-intensive green roof consisting of extensive and intensive elements. A perennial garden development is lighter weight and less costly than an intensive green roof, and it is generally designed to have plants with lower maintenance requirements as well. On the other hand, due to deeper substrate and greater water retention capabilities, a perennial garden has a wider range of design options than an extensive 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 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 System used. ZinCo Canada 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 system, test the water tightness of the roofing system by flood testing for at least a 48 hour period or an electronic leak



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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 system.

ENVIRONMENTAL CONDITIONS

- The plant community should be chosen in consideration of the climatic circumstances and hardness 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:

- Six visits in the first year.
- Six 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 Aquatec ® AT45: Lightweight Lawn.

Supplier:

ZinCo Canada Inc.
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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: 0,40 mm. Weight: 380 g/m².

2. SEPARATION/PROTECTIVE LAYER

(PLEASE CHOOSE CONVENTIONAL OR INVERTED ASSEMBLY)

(CONVENTIONAL ROOF ASSEMBLY)

- **ZinCo moisture retention and protection mat TSM32** made of recycled non-rotting fibers for water- and nutrient retention as well as a protection layer. Thickness: 3 mm. Weight approx. 320 g/m². Water retention capacity: 3 l/m². Bitumen resistant – Biologically and Chemically neutral.

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.



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3. DRAINAGE - WATER STORAGE LAYER

- **Water distribution, storage and drainage element ZinCo Aquatec AT 45** made of thermoformed recycled hard plastic (ABS), developed especially to be used in combination with the Wicking Mat DV 40 and drip lines to be clipped directly into the Aquatec element. Weight: approx. 2 kg/m². Dimensions: 1.00 x 2.00 x 0.045 m. Water storage capacity: approx. 17 L/m². With integrated clips for drip line irrigation.

4. WICKING MAT

- **Water distributing polyester fleece ZinCo Wicking Mat DV 40** with capillary-effective fibers on one side, developed especially for the use in combination with the water distribution, storage and drainage element Aquatec® AT 45 for efficient irrigation of green roofs. Weight: approx. 600 g/m². Fiber length: approx. 40 mm.

5. GROWING MEDIUM

- **Growing medium for semi-intensive 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: 150 mm or more.

(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): 1300 - 1600 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) ≥ 0.001 cm/sec

pH

6.5 - 9.5

Organic Measurements

Organic matter content: ≤ 12% mass%

Nutrients

Phosphorus, P205 (CAL): ≤ 200mg/L

Potassium, K2O (CAL): ≤ 700mg/L

Magnesium, Mg (CaCl2): ≥ 200mg/L

Nitrate + Ammonium (CaCl2): ≤ 80mg/L

6. PLANT MATERIAL

- **Drought resistant plants:** Plant material potted in 90 mm (or 4") pots. (Type of plants dependent of the climate and hardiness zone) Quantity: at least 11 plants/m²; To be selected by landscape architect or green roof manufacturers consultant.

Or

- **Seed:** A seed mix of drought tolerant (native) low maintenance plants suitable for semi-intensive. Sow rate: 275 g/ 100 m². Ideally, sowing should take place in the fall for planting result the next spring.

Or

- Sod: grass that has been seeded and cultivated in nursery sod fields as a turf grass sod. At the time of sale, Number One Grade Turf grass Nursery Sod should be in a healthy condition. Sod of this quality may contain 1 broadleaf weed per 40 square meters and up to 1% native grasses. Sod should be of sufficient shoot density that no surface soil will be visible from a standing position when mowed to

a height of 4 centimeters. The mowing height range should be 3 to 7 centimeters with the exception of creeping bent grass sod where mowing height is determined by the end use. The thickness of the soil portion of the sod should not exceed 1.5 centimeters

(PLEASE CHOOSE REQUIRED PLANTING METHOD)

7. RELATED PRODUCTS

- **ZinCo inspection chamber KS 10** made of plastic coated galvanized steel with thermally insulated cover, resistant to compression. Height: 100 mm. To ensure accessibility of the roof drains at any time. Dimensions: 0.25 x 0.25 x 0.06 m. Weight: 3 kg.
- **Drip line ZinCo 100 L-1** with internal drippers for irrigation of green roofs; outer diameter ca. 16 mm; dripper spacings 100 mm; dripper capacity ca. 1 l/h; pressure-compensation between 0.4 and 2.5 bar, delivery and clipping into the holders of the water distributing, storing and draining element Aquatec® AT 45 according to manufacturer's instructions.
- Pre-assembled **Irrigation control unit ZinCo BM 4** 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. Required water pressure on the roof: min 2.5 bar. Weight: approx. 15 kg. Dimensions: 480 x 480 x 300 mm.

(In combination with Aquatec® AT 45 water distribution elements, the Wicking Mat DV 40 and drip lines 100-L1 up to 200 m² of roof area can be irrigated per magnetic valve. With the irrigation-control unit BM 4 a total area of up to 800 m² can be irrigated consecutively.



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- **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. Including joint connectors.
- **Gravel strip** to protect roofing details, using a 1"-2" round aggregate. Width: at least 30 cm. Depth: 150 mm.

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

(CONVENTIONAL ROOF ASSEMBLY)

Deliver and install the **ZinCo moisture retention and protection mat TSM32** 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

(PLEASE CHOOSE CONVENTIONAL OR INVERTED ASSEMBLY)

(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 distribution, storage element ZinCo Aquatec® AT45** directly on the protection mat or diffusion membrane according to the manufacturer's instructions. Install the Aquatec elements side by side with the ventilation and evaporation holes facing up and fix the elements together with connectors on the sides. 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. WICKING MAT

- Deliver and install the **ZinCo wicking mat DV 40** on the drainage layer with a minimum overlap of 100 mm according to the manufacturer's instructions. The wicking mat must be installed above the growing medium along the edges and roof penetrations. Cut the wicking mat in place along the edges and at roof penetrations. place along the edges and at roof penetrations.

6. GROWING MEDIUM

- Deliver and install the **growing medium for semi-intensive Green Roofs ZinCo Blend-SI** on the filter sheet. Spread out the growing medium equally to a depth of 100 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

- 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.

Potted plants:

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

Seed:

Whenever possible, work up the growing medium a little to ensure good seed-to-soil contact for improved germination. Apply the required seed quantity and spread it over the roof equally. Cover the cuttings with a thin layer (10 mm) of compost mulch. Moist the seeds right after the installation

Sod:

Sod shall be laid in smooth and even rows, closely knit, tight together in such a manner with no open joints visible, joints staggered a minimum of 25 cm, and no pieces are stretched or overlapped.

Newly sodded areas shall be protected from heavy foot traffic during laying. Planks shall be placed if necessary to prevent damage.



The sodded area shall be rolled, tamped, or planked providing sufficient pressure, to ensure a close contact between sod and soil. Heavy rolling to correct irregularities in grade shall not be permitted.

10. MAINTENANCE

- Execute the maintenance program as described on page 2.

The sod area shall be watered immediately with sufficient amounts to saturate the sod and penetrate through the sod into the growing medium/

END OF SECTION

(PLEASE CHOOSE REQUIRED PLANTING METHOD)

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 wicking mat 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.
- Deliver and install the **ZinCo drip line 100 L-1** by using the connectors in the ZinCo Aquatec AT45 element. The maximum length of tubing is 75 m at a water pressure of 2.5 bar
- Deliver and install the **ZinCo Irrigation Control Unit BM 4** at the required location on top of the wicking mat. Connect the water supply and the drip lines following the manufacturer's instruction.
- **Gravel strip**
Deliver and install a gravel strip along roof edges, flashing details and roof penetrations using a 1"-2" round aggregate. Depth: 150 mm.

9. COMPLETION

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

