

- 00 Q37 GREEN ROOFS

To be read with Preliminaries, General Conditions, Contract Conditions and related Architectural Details

- 00.1 GENERAL

- 00.1.0001 SEMI-INTENSIVE GREEN ROOF

Roof Type:

ZinCo "Heather with Lavender" with FD 40-E with European Technical Approval ETA-13/0668, Manufacturer: ZinCo Green Roof Systems Ltd., Wittas House, 2 Rivers Industrial Estate, Station Lane, Witney, OX28 4BH; phone: 01993 229700

Water Proofing:

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Root Barrier - optional

- ZinCo Root Barrier WSB 100-PO
 - If the waterproofing is not root resistant, the root barrier ZinCo WSB 100-PO is required additionally

Insulation

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Protection Layer

- ZinCo Moisture Retention / Protection Mat SSM 45

Drainage Layer

- Floradrain® FD 40-E

Filter Layer

- ZinCo Filter Sheet "SF"

Growing Medium

- ZinCo System Substrate "Heather with Lavender"

Vegetation

- Semi-intensive planting

Irrigation during initial period

- Thorough irrigation after planting and other early irrigations are required depending on the weather and vegetation type.

Fertilization

- ZinCo "Plantfit 4 M"

Gravel Edge

- Roofing pebbles 20/40 mm

Inspection Chamber

- ZinCo Inspection Chamber KS 10

Gravel Retainer

- ZinCo Gravel Retainer KL "100/120", KL 140/160

- 00.2 PERFORMANCE

- 00.2.0010 GENERAL DESIGN

- Green roof and associated features: Complete the detailed design.
- Proposals: Submit drawings, technical information, calculations and manufacturers' literature
- Performance design: As landscape designer's requirements

- Falls: Check that there is a minimum incline of about 2 % between the highest and the lowest drainage points.
 - It must be ensured, that the waterproofing covering ensures a continuity to a vertical height of at least 150 mm above the finished roof level at all abutments, parapets etc.
- 00.2.0015 **MAXIMUM PERMITTED GREEN ROOF LOADS**
- It is the strict responsibility of the building owner or their appointed design professional to make sure that the building structure and the roof can hold the different loads
 - Dead load: Green roof layers: refer to engineer's specification
 - Imposed loads:
 - Activity: refer to engineer's specification
 - Vegetation: refer to engineer's specification
 - Allowance for additional loads during construction: refer to engineer's specification
 - Service loads: refer to engineer's specification
- **00.3 PRODUCTS**
- 00.3.0001 **ROOT BARRIER - OPTIONAL**
- Manufacturer:**
- ZinCo Green Roof Systems Ltd
- Product reference:**
- ZinCo Root Barrier WSB 100-PO
- Materials and properties:**
- Made of polyester scrim reinforced flexible polyolefin (FPO), resistant to bitumen and for short periods of time resistant to oil.
 - Thickness: ca. 1.10 mm
 - Tensile strength according to European Standard EN 12311-2: 800 N/5cm
 - Tensile expansion according to EN 12311-2: > 20 %
 - Root barrier tested according to the German FLL method 2002
 - Available accessories (include, where needed):
ZinCo "WSB 100-PO-external edge" prefabricated external corner piece made of FPO
- 00.3.0004 **PROTECTION LAYER**
- Manufacturer:**
- ZinCo Green Roof Systems Ltd
- Product reference:**
- ZinCo Moisture Retention / Protection Mat SSM 45
- Material and Properties:**
- High quality fibre mat made of polyester/polypropylene, with fleece backing, non-rotting
 - Protective effect according to European Standard EN ISO 13428: residual thickness = 25 %
 - Tensile strength according to EN ISO 10319: > 5.5 kN/m, extension lengthwise: > 75 %
 - Penetration force according to EN ISO 12236 > 2000 N
 - Strength class: 3
 - Thickness: ca. 5 mm
 - Weight: ca. 470 g/m²
- 00.3.0008 **DRAINAGE LAYER**
- Manufacturer:**
- ZinCo Green Roof Systems Ltd
- Product reference:**
- Floradrain®FD 40-E

Material and Properties:

- Drainage and water storage element of recycled polyolefin, with water storage cells and openings for ventilation and evaporation as well as multidirectional drainage channel system on the underside.
- Height: ca. 40 mm
- Water storage capacity: ca. 5 l/m²
- Filling volume: ca. 17 l/m²
- Max. compressive strength (without filling): 170 kN/m²
- In-plane water flow capacity tested according to EN ISO 12958

- 00.3.0015 FILTER LAYER

Manufacturer:

- ZinCo Green Roof Systems Ltd

Product reference:

- ZinCo Filter Sheet "SF"

Material and Properties:

- Thermally strengthened sheet of polypropylene
- Weight: ca. 100 g/m²
- Penetration force according to EN ISO12236: ca. 1100 N
- Strength class: 2
- Flow rate (H₅₀) according to EN ISO 11058: ca. 70 l/(m²·s)
- Effective opening width (O₉₀) according to EN ISO12956: ca. 95 µm

- 00.3.0021 GROWING MEDIUM

Manufacturer:

- ZinCo Green Roof Systems Ltd

Product reference:

- ZinCo System Substrate "Heather with Lavender"

Material and Properties:

- Substrate for intensive green roof applications consisting of Zincolit[®] Plus (sorted high quality crushed brick with selected aggregates), enriched with Zincohum[®] (substrate compost enriched with fibre materials), non-flammable, stable in structure and frost resistant, suitable for pumping. All chemical and physical properties meet the requirements of the FLL Guidelines for the Planning, Construction and Maintenance of Green Roofing - Green Roofing Guideline, 2008
- Volume weight dry (compacted): ca 1000 kg/m³
- Volume weight at max. water capacity (compacted): 1500 kg/m³
- Maximum water capacity: ca 50 vol %
- Compaction factor: ca. 1.25
- Required depth (after compaction): averagemm, according to plan.

Supply:

- 1.2 m³ bulk bags, loose or 25 litre bags

- 00.3.0023 VEGETATION

- Semi-intensive planting according to planting list and planting plan or according to site manager, including first irrigation

- 00.3.0024 IRRIGATION

- Thorough irrigation after planting.

- Other early irrigations as required depending on the weather. Vegetation has to be watered and kept moist for minimum of: 3 to 4 weeks for plantings
- 00.3.0025 FERTILIZER
- Manufacturer:**
- ZinCo Green Roof Systems Ltd
- Product reference:**
- ZinCo "Plantfit 4 M"
- Material and properties:**
- Slow release fertilizer NPK 23-5-10, granulated and compacted, with at least 80% coated particles, applied evenly onto the substrate layer after planting.
 - The recommended period to fertilize: March to Mid-June.
 - Amount to be spread: ca: 40 g/m²
 - Development and maintenance fertilization as needed every 2–3 years: 40 g/m²
- 00.3.0027 GRAVEL EDGE
- Material and Properties:**
- Roofing pebbles 20/40 mm
at roof perimeters, in areas of upstands, around penetrations, inspection chambers, fixing devices (Ø ca. 50 cm) and similar, according to roof plan
- 00.3.0040 ACCESSORIES - INSPECTION CHAMBERS
- Manufacturer:**
- ZinCo Green Roof Systems Ltd
- Product reference:**
- ZinCo Inspection Chamber KS 10
- Material and Properties:**
- Inspection chamber made of plastic-coated aluminium, detachable and walkable cover made of galvanized and plastic-coated steel or alternatively with galvanized grill, with pull out flange at two opposite sides.
 - Lateral drainage slots according to DIN 1986
 - Load bearing capacity: Class H, according to DIN 19599
 - Outer dimension of the Chamber: ca. 300 x 300 mm, including flange: ca. 300 x 530 mm
 - Aperture dimension: ca. 240 x 240 mm
 - Height: ca. 100 mm
 - Also available: extension pieces KSA 8 (height 80 mm) / KSA 20 (height 200 mm) - *include where needed*
 - With or without set of interlocks (*please delete as appropriate*)
 - Cover:
 - Height including extension pieces:..... mm
- 00.3.0047 ACCESSORIES - GRAVEL RETAINER
- Manufacturer:**
- ZinCo Green Roof Systems Ltd
- Product reference:**
- ZinCo Gravel Retainer
KL "100/120", KL "140/160"
- Material and Properties:**
- Angle profile made of extruded aluminium
with drainage slots on both legs
 - Material thickness: ca. 1.8 mm (type KL 100/120), ca. 2.2 mm (type KL 140/160)

- Profile height ca. 100/120 mm, 140/160 mm
 - KL 140/160 with preattached connectors
 - Available accessories (*include as necessary*)
 - connectors: 100/120 mm
 - corner connectors: 100 mm, 120 mm
 - corners for KL 140/160 on request
 - Installation height: mm
- **00.7 EXECUTION**
- **00.7.0000 INSTALLATION GENERALLY**
- Preparation: Clear all surfaces of debris.
 - Timing: After certification of waterproof membrane integrity
 - Surface condition: Visually inspect waterproof membrane, report any damage or possible sources which might affect the condition
 - Faults in waterproof membrane: Report
 - Contamination: Do not use materials detrimental to healthy plant growth
 - Storage: Do not overload
 - Point loads: Avoid
 - Outlets: Do not block
 - Outlet grilles: Installed
- **00.7.0010 ADVERSE WEATHER**
- Unfinished work: Secure from damage and wind uplift
 - Conditions: Do not install or work with frozen materials
- **00.7.0001 ROOT BARRIER INSTALLATION**
- Extent: Install Root Barrier WSB 100-PO continuously over entire roof area above the non-root resistant water proofing.
 - Joints: Minimize.
 - Fitting: hot air welded
 - Overlaps: minimum 75 mm
 - Seams: minimum 38 mm in case of automatic welding, minimum 50 mm in case of manual welding
 - Upstands: Extend to a vertical height of at least 150 mm above the finished roof level.
 - Water outlets: Fit closely around penetrations and outlets using handmade form pieces made of the root barrier.
 - General: Follow manufacturer's specific installation instructions
- **00.7.0004 PROTECTION LAYER INSTALLATION**
- Extent: Install protection layer continuously over entire roof area above the water proofing or root barrier.
 - Joints: Minimize.
 - Overlaps: minimum 100 mm
 - Fitting: loose laid
 - Upstands: Extend to a vertical height of at least 150 mm above the finished roof level.
 - Water outlets and roof penetrations: cut the protection mat in situ and fit closely around penetrations and outlets.
 - General: Follow manufacturer's specific installation instructions.
- **00.7.0008 DRAINAGE LAYER INSTALLATION**
- Extent: Install FD 40-E continuously over entire roof area on protection or separation layer
 - Joints: Minimize.
 - Fitting: butt joint, or optional with 1-2 stud rows of overlap

- Connection, optional: Press connection clamps into diffusion openings.
 - Evaporation holes: facing up - for green roof applications
 - Water outlets and roof penetrations: Cut in situ and fit closely around penetrations and outlets.
- 00.7.0015 FILTER LAYER INSTALLATION
- Extent: Install filter sheet continuously over entire roof area above the drainage element.
 - Joints: Minimize.
 - Overlaps: minimum 200 mm
 - Fitting: loose laid
 - Water outlets and roof penetrations: Cut the filter sheet in situ and fit closely around penetrations and outlets.
- 00.7.0021 GROWING MEDIUM INSTALLATION
- Handling: Minimize.
 - Conditions: Handle in the driest condition possible. Do not handle or install when wet or frozen.
 - Extent: Install System Substrate "Heather with Lavender" continuously over entire roof area above the filter sheet.
 - Required depth (after compaction):
averagemm, according to plan
 - Settlement factor: 1.25
 - Sequence: Gently firm each layer before spreading the next. Apply nutrient regime according to planting plan and rake in.
- 00.7.0023 VEGETATION INSTALLATION
- Extent: Install vegetation professionally according to planting plan.
 - Storage: The Plug plants must be stored in a cool and shaded area, excessive stacking not permitted
 - Watering: Water the plug plants prior to planting. Thoroughly water directly following installation, and don't let dry out completely until plants have taken roots (approx. 4 - 6 weeks). Subsequently irrigate in periods of drought if necessary.
- 00.7.0027 GRAVEL EDGE INSTALLATION
- Extent: Install roofing pebbles in the required depth at non-vegetated areas, including roof edges, flashing, and roof penetrations
- 00.7.0040 INSPECTION CHAMBER INSTALLATION
- Location: Install KS 10 centrally over drain outlet, place chamber on top of drainage layer.
 - Orientation: Align parallel with adjacent features.
 - Filter Sheet: Install the ZinCo Filter Sheet SF on top of the flange of the inspection chamber.
- 00.7.0047 GRAVEL RETAINER INSTALLATION
- Installation: If used as separation between roofing pebbles and growing medium the profiles are applied loosely on top of the filter sheet. As separation of the entire build-up e.g. to a lower gravel strip the profile can be placed loosely on the protection mat.
 - Orientation: Depending on the desired height install the profile with the smaller or larger leg facing up.
 - Joints: The suitable joint connectors are inserted from the inside between the folded edge at the top and the supporting leg.
 - Corners: Place two gravel retainers next to each other, with their supporting legs facing outwards for internal corners, with their supporting leg facing inside for external corners, and insert the corner connector.
 - Fitting: Cut the retainers on site and deburr any sharp grates.

- **00.9 COMPLETION**
- **00.9.0010 INSPECTION**
 - Timing: Before handover
 - Give notice (min.): 3 days
- **00.9.0020 COMPLETION**
 - General: Leave the work in a clean, tidy condition
 - Surfaces: Clean immediately before handover.
 - Outlets: Clean and clear obstructions.
 - Completed green roof: Protect from adjacent or high level working.
- **00.9.0030 DOCUMENTATION**
 - Timing: Submit at handover.
 - Contents:
 - Growing medium declaration of analysis
 - Manufacturer's guarantees and warranties
 - Procedures for maintenance of the green roof
 - Record drawings showing the location of planting and associated features

The specification is for guidance only and ZinCo Green Roof Systems Ltd cannot be held responsible for any errors or omissions.

It is the specifier's responsibility to ensure that the specification is suitable for the requirements of the construction. This specification may require adjustment in accordance with project specific requirements. The substitution of any products is strictly prohibited, unless agreed in writing, in advance, with ZinCo.