

Viking Roof Garden System

Version: RG-PDS-V1.0

Introduction:

This Data Sheet is to serve as a reference guide for Viking Roofspec Licensed Installers who are already familiar with Viking Roofspec's systems and are responsible for Viking roof-system installations. The following guide contains precautions, best uses and application procedures for the correct installation of Viking's Roof Garden system.

A green roof, also known as a roof garden or living roof, is a sustainable and eco-friendly roofing system that involves covering the roof of a building with vegetation, soil, and various layers of waterproofing and drainage materials. This approach transforms an otherwise unused or underutilized roof space into a functional and environmentally beneficial area. Green roofs come in various types, but they typically consist of the following components:

1. **Waterproofing Layer:** This layer prevents water from seeping into the building structure and causing damage. It is typically made of materials such as rubber membranes or modified bitumen.
2. **Root Barrier:** A root barrier is used to prevent plant roots from penetrating the waterproofing layer and potentially causing damage.
3. **Drainage Layer:** A drainage layer allows excess water to flow away from the roof, preventing waterlogged soil and providing proper irrigation for the plants.
4. **Growing Medium:** This layer consists of a lightweight, engineered soil or substrate that supports plant growth while maintaining a relatively low weight load on the roof structure.
5. **Vegetation:** Various types of plants, including grasses, sedums, wildflowers, and even small trees, can be planted on the green roof. The selection of plants depends on factors like climate, maintenance requirements, and aesthetic goals.

Viking's Roof Garden system incorporates a Viking Roof-Garden G4 Drainage Board above a waterproofing assembly of either Viking Enviroclad TPO or 2 layers of Viking Torch-on Garden FLL Anti-Root. To improve thermal efficiency a Viking WarmRoof can also be specified below the roof-garden and waterproofing assemblies.

Growth media (soil) and planting are supplied and installed by companies through-out NZ that Viking Roofspec are partnering with to provide a convenient solution for the specifier or building owner.

1. **Environmental Benefits:** They help reduce the urban heat island effect, improve air quality by filtering pollutants, and promote biodiversity by providing habitat for birds and insects.
2. **Energy Efficiency:** Green roofs can reduce heating and cooling costs by providing additional insulation and reducing heat transfer through the roof.
3. **Stormwater Management:** They absorb and store rainwater, reducing stormwater runoff and the risk of flooding in urban areas.
4. **Extended Roof Lifespan:** The vegetation and protective layers can extend the lifespan of the roofing materials by shielding them from the elements.
5. **Aesthetics:** Green roofs enhance the visual appeal of buildings and can create tranquil and aesthetically pleasing spaces for building occupants.
6. **Noise Reduction:** They can help absorb and reduce noise pollution from the surrounding environment.

Properties

Viking Roof-Garden G4 Drainage Board (SRG001)

- Combines filter fabric, moisture retention mat, drainage board, and heavy-duty protection fabric into a single, easy-to-install product specifically designed for vegetated roofs or ballast roof systems. The formed cups within the drainage board have a capacity up to 8.9 L per M2 to aid in easing demand on stormwater loading or irrigation for vegetation.
- Roll Size 1.2mt x 15.2mt, total thickness 30mm.

Roof-Garden Root Barrier (SRG002)

- For use with Enviroclad TPO membrane only, as Viking Torch-on Garden FLL Anti-Root is formulated to repel root attack.
- Non-reinforced, heat-weldable, polypropylene sheet specifically formulated for use in below-grade and vegetated applications to resist root penetration and soil bacteria. Root Barrier is typically used in medium to deep Roof Garden assemblies where plants, such as grasses, with intrusive roots are used. This high-performance Root Barrier is based on a UV-stabilized polypropylene copolymer which does not require polymeric or liquid plasticizers to maintain flexibility. The relatively smooth surface of the Root Barrier facilitates production of a total surface fusion weld that creates a consistent, watertight, monolithic sheet.
- Supplied 3.660mt wide x 30.4mt (sold CTL) 1mm thickness.

Viking Roof Garden Aluminium Edge

- 2mm thick Alum Mill Finish size: 75mm x 100mm x 2.4m length

Viking Roof Garden Aluminium Drain Box

- 3mm thick Alum Mill Finish size: 100mm H x 300mm x 300mm (+ 100mm flanges = 500 x 500mm)

Waterproofing Membrane selection of either

- Viking Enviroclad TPO 1.52mm (with use of Roof-Garden Root Barrier SRG002) or,
- Viking Torch-on Garden FLL Anti-Root (2 Layer Bituminous System)
 - Phoenix Super Cap sheet where exposed to UV

Component Weights	
Component	Weight includes adhesives or primers
Enviroclad 1.52mm	1.6 kg per m ²
Roof-Garden Root Barrier (SRG002)	1.03 kg per m ²
Torch-On Base Sheet (APAO/SBS)	3.5kg per m ²
Torch-On SEM630 FLL Anti-Root	5 kg per m ²
Roof-Garden G4 Drainage Board 30mm (SRG001)	4 kg per m ²
Water-holding	8.9 kg per m ²

Installation

Installation of Viking Roof-Garden components

**Refer to Viking Roof Garden Details and specification*

Substrate Options

- 1) Concrete substrates must be subject to specific engineering design, meeting the requirements of the NZBC, Such as Concrete Construction to NZS3101
- 2) Plywood substrates must be subject to specific engineering design, meeting the requirements of the NZBC.
Plywood must be treated to H3 (CCA treated). LOSP treated plywood must not be used. Plywood must comply with NZBC Acceptable Solution E2/AS1, Paragraphs 8.5.3 and 8.5.5. Where specific design is required (i.e., the building is outside the scope of NZS 3604 and NZBC Acceptable Solution E2/AS1), the plywood thickness and fixing size may increase, and centres may decrease to meet specific wind loadings and structural integrity requirements.

Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604 or comply with the serviceability criteria of AS/NZS 1170. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and that all sheet edges are fully supported.

- 3) Viking Roofspec requires an Electronic Leak Detection System to be incorporated with all Roof Gardens on a Plywood Substrate the Electronic Leak Detection System (ELD) should be installed immediately under the waterproofing membrane installation to enable non-invasive inspections of the waterproofing assembly and sign-off of QA Checklist prior to Roof Garden installation.

** Substrates should be designed and engineered by a licenced trades person.

Enviroclad Assembly

1. Install Enviroclad TPO as per Viking Roofspec Standard installation to provide a watertight membrane surface.
 - *Refer to standard specification and details for Viking Enviroclad Membrane*

Roof-Garden Root Barrier (SRG002) only over Enviroclad membrane

2. Unroll Viking Roof-Garden Root Barrier making sure to overlap the sheets by min. 75mm at the seams.
3. Root Barrier shall terminate inside vegetation-free zones by extending a minimum of 75mm past Aluminium Edge.
4. To secure, spot weld to Enviroclad membrane.
5. Hot weld seams 40mm using a Leister hot-air welder or equivalent to create a monolithic sheet. Once the welds are completed, check the seams for any leaks using a seam probe.
6. Viking Roof-Garden G4 Drainage Board (SRG001) will typically be loose laid above the Root Barrier.

Viking Roof Garden Aluminium Edge and Aluminium Drainage Box

*Installed directly over the waterproofing membrane or Root Barrier.

- Prime the Enviroclad membrane and Aluminium flange with Viking SEC034 WeatherBOND Multipurpose primer (SEC034).
- Apply Viking Lap Tape (SMT076V) to the bottom side of the Aluminium flange, ensuring that the Viking Lap Tape extends 6mm beyond the edges and corners. Place *Aluminium Edge or Drain Box in desired location, ensuring Alum Edge flange is facing inward towards the Roof Garden system.
- Carefully remove the release liner by pulling at a 90° angle.
- Once release liner has been removed, apply adequate pressure by pressure rolling the flange.

Viking Roof-Garden G4 Drainage Board (SRG001)

7. Unroll and loose-lay Viking Roof-Garden G4 Drainage Board and orient GREEN SIDE UP.
8. Butt adjacent rolls and overlap using the built-in 150mm flap of moisture retention mat. Make sure to shingle orientate the flap in the direction of the slope.
9. For end-to-end joints, peel back fabric and insert two rows of cups into the pre-existing piece.

Note: Viking Roof-Garden G4 Drainage Board should not be adhered to the membrane or Anti-Root barrier

Torch-On Assembly**Base Sheet**

1. Install Viking Torch-On as per Viking Roofspec Standard installation to provide a watertight membrane surface.
Refer to standard specification and details for Viking Torch-On Membrane
2. Recommended Base sheets
 - Viking Phoenix Galaxy APAO Base Sheet
 - General Garden FFL Anti-Root
 - Viking Self-Adhered SBS Base Sheet

Cap Sheet - General Garden FLL Anti-Root

3. Before proceeding, ensure the first layer has been completed and tested.
4. If there has been an extended period between installing the base layer and the Anti-Root sheet, then ensure the base layer is clean and dry.
5. The laps of the Anti-Root sheet must offset the laps of the base sheet by half or 500mm.
6. Torch down the Anti-Root sheets so that they are fully bonded to the base sheet.
7. After each two or three rolls are laid. Weld all lap joints ensuring a bead of bitumen bleed is visible to seal the lap sheets ends, testing all joints progressively.

Viking Roof Garden Aluminium Edge and Aluminium Drainage Box

*Installed directly over the waterproofing membrane or Root Barrier.

- Sand and prime the Aluminium flange with Viking Torch-on solvent-based Rapid-Primer (SES297)
- Apply heat to Torch-on membrane and place Alum flange in location. Pressure roll flange to Torch-on membrane to secure.

Viking Roof-Garden G4 Drainage Board (SRG001)

8. Unroll and loose-lay Viking Roof-Garden G4 Drainage Board and orient GREEN SIDE UP.
9. Butt adjacent rolls and overlap using the built-in 150mm flap of moisture retention mat. Make sure to shingle orientate the flap in the direction of the slope.
10. For end-to-end joints, peel back fabric and insert two rows of cups into the pre-existing piece.

Precautions

Viking Roofspec strongly recommend that use of an Electronic Leak Detection System is incorporated immediately under the waterproofing membrane installation to enable non-invasive inspections of the waterproofing assembly and sign-off of QA Checklist prior to Roof Garden installation.

PRE-INSTALLATION SITE MEETING: A PRE-installation meeting should be coordinated by the specifier and attended by the roofing applicator, a Viking Roofspec representative, electronic leak detection expert (if used); and other trades working on the roof system - before membrane installation. The purpose of meeting is to discuss the necessity of ensuring proper installation of ELD and waterproofing assembly as well as protection during all phases of installation and to review other applicable requirements or unusual field conditions. 4 weeks minimum notice will be required.

POST-MEMBRANE INSTALLATION SITE MEETING: A **POST-installation meeting** should be coordinated by the roofing applicator and attended by the main-contractor, a Viking Roofspec representative, electronic leak detection expert (if used); growing media and vegetation supplier / installer and any other trades working on the roof system - **after membrane installation**. The purpose of meeting is to confirm that the waterproofing membrane assembly has been installed according to Viking Roofspec's specifications and details, to conduct a Flood-test utilising the ELD system (if used) with any identified repairs made and reinspected to 100% water-tight quality. Complete the QA Checklist.

Main-contractor and roofer to ensure no risk of damage exists to completed sections. With correct use of protection and access boards installed by main contractor.

QA CHECKLIST AND ROOF PLAN SUBMITTED TO VIKING ROOFSPEC: Complete the Viking QA Checklist after inspections and any repairs. To be signed by Roofing Applicator, ELD expert (if used), Viking representative and main contractor prior to Roof-Garden components being installed above.

Storage

Handling and storage of all materials whether on or off site is under the control of the Viking Roofspec Licensed and Trained Installers. Dry storage must be provided for all products, do not let products get crushed under weight of stacking pallets on top of each other.

Notes

*For end-to-end joins of Aluminium Edging, allow for 3mm gap to compensate for thermal expansion. Aluminium Drain Box may be loose laid over the protection fabric or a sacrificial sheet of membrane. With the Drain Box being held in place with the weight of the approved ballast material.

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