



Versico LiveRoof® System

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Details



Versico LiveRoof® System

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PART 1 GENERAL

1.01 DESCRIPTION

The Versico LiveRoof® System incorporates pre-planted, pre-grown “module trays” in lieu of traditional components used above an adhered roofing membrane (i.e., drainage boards, root barriers, moisture mats, and growth media). The roofing membrane may consist of VersiGard® (black) non-reinforced or reinforced EPDM membrane or VersiWeld® TPO membrane. The type of membrane is dependent upon the length of warranty selected. Refer to Paragraph 1.03, Design Guidelines, for specific requirements.

The “module trays” are lightweight, composed of recycled plastics (100% post industrial recycled polypropylene), with walls 100-mils thick, and arrive at the building site ready for installation. Standard tray size is 1' x 2' x 3-1/4" with 4-1/4" soil depth.

For information about the LiveRoof modules, weights, planting types, and growth media, refer to Part 2, Products.

1.02 EXTENSIVE (SHALLOW) GREEN ROOF DEFINITION

A shallow planting system (using 3-1/4" tall LiveRoof tray modules) pre-planted and pre-grown to a height of approximately 4-1/4" using an engineered blend of inorganic and organic components. The growing media types are chosen for the specific climate zone and the anticipated weight above the membrane assembly is approximately 27-29 pounds per square foot.

1.03 DESIGN GUIDELINES

- A. For 10 or 15-year warranties, the assembly requires the use of 60-mil EPDM or 60-mil TPO installed in an adhered fashion.
- B. For 20-year warranties, the assembly requires the use of 75-mil VersiGard Reinforced EPDM or 72-mil VersiWeld TPO installed in an adhered fashion.
- C. An EPDM or TPO membrane shall be fully adhered, typically to polyisocyanurate insulation, with layers of insulation set in adhesive. As an option, bottom layers of insulation can be mechanically fastened to the roof deck with the top layer set in adhesive.
- D. Refer to Versico’s specifications for specific requirements concerning membrane adhesion and splicing criteria, insulation type and securement methods, product delivery, storage and handling guidelines, and applicable installation of all materials and details.
- E. To facilitate drainage, a **minimum roof slope of 1/4" in 12"** must be provided at the waterproofing membrane level.

- F. The Versico LiveRoof System shall not be installed on projects over 50' in height. Projects in excess of 50' must be forwarded to Versico for review prior to bid and installation.
- G. Proper decking shall be provided by the building owner. The building owner or its designated representative must ensure the building structure is investigated by a registered engineer to ensure its ability to withstand the total weight of the specified roofing system, as well as construction loads and live loads, in accordance with all applicable codes. The specifier must also designate the maximum allowable weight and location for material loading and storage on the roof.
- H. The installation season for the LiveRoof system will vary based upon the local climate. LiveRoof modules may be installed when all of the following conditions are met:
 - 1. The roof is frost- and ice-free
 - 2. The plant material has been properly cold- or heat/sun- acclimatized at the LiveRoof nursery
 - 3. The soil within the modules is unfrozen
 - 4. The LiveRoof modules are vegetated with 95% coverage or greater.
- I. Prior to installing the LiveRoof modules, a black 40-mil GeoMembrane slip sheet shall be installed over the roofing membrane at all areas where the modules will be placed. When VersiWeld TPO membrane is used, Geomembrane sheets shall be field welded a minimum of 1-1/2" in width using a Heat Welder. As an option for VersiGard EPDM membranes, QA Seam Tape/V-150 or LV-600 Primer can be used to splice adjoining slip sheets.
- J. When trays are to be installed in high wind areas, Versico should be contacted regarding appropriate methods to prevent tray movement and/or soil media wind erosion.

1.04 QUALITY ASSURANCE

- A. A **pre-installation meeting** should be coordinated by the specifier and attended by the LiveRoof installer, the roofing applicator, membrane manufacturer's representative and other trades working on the roof system both before and after membrane installation. The purpose of this meeting is to discuss the necessity of ensuring proper membrane protection during all phases of installation and to review other applicable requirements or unusual field conditions.
- B. Upon request by the Authorized Applicator, an inspection will be conducted by a Field Service Representative of Versico to ascertain that the membrane roofing system has been installed according to Versico's specifications and details. This inspection shall be coordinated **prior to installing the LiveRoof components** (40-mil GeoMembrane slip sheet and the LiveRoof modules) so access to the membrane is not impaired.

Note: The roofing applicator must notify Versico at least 3 weeks in advance of applicable inspection dates for coordination purposes.

- C. A final inspection will be conducted after application of the LiveRoof modules to ensure proper installation.
- D. Flood testing, electronic testing, or other leak detection means are strongly advised to check the waterproof integrity of the membrane prior to installing the LiveRoof components (black 40-mil GeoMembrane slip sheet and the LiveRoof modules).

1.05 SUBMITTALS

- A. To ensure compliance with Versico's warranty requirements, **all projects should be forwarded to Versico for review** prior to installation.

- B. **A dimensioned layout of LiveRoof modules and all field splices shall be included** along with the project submittals (shop drawing and Request for Warranty).
- C. For all projects, prior to project inspection by Versico, a final shop drawing must be approved by Versico.

1.06 WARRANTY

- A. A **10, 15 or 20-year** System Warranty is available for a charge on commercial buildings and applies only to **products manufactured or marketed by Versico Incorporated**. The membrane system is defined as membrane, flashings, adhesives, sealants, and other Versico brand products utilized in this installation. For a complete description of these products, refer to the “Products Section” or the applicable “Attachment” in the Versico specifications.
- B. The formation or presence of mold or fungi in a building is dependent upon a broad range of factors including, but not limited to, the presence of spores and nutrient sources, moisture, temperatures, climatic conditions, relative humidity, and heating/ventilating systems and their maintenance and operating capabilities. These factors are beyond the control of Versico and Versico shall not be responsible for any claims, repairs, restoration or damages relating to the presence of any irritants, contaminants, vapors, fumes, molds, fungi, bacteria, spores, mycotoxins, or the like in any building or in the air, land, or water serving the building.

1.07 JOB CONDITIONS

- A. Coordination between various trades is essential to avoid unnecessary rooftop traffic over sections of the roof and to prevent damage to the membrane. Heavily traveled areas must be protected by placing temporary protection courses to prevent damage to the membrane.
- B. The use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly should be investigated by the specifier. Consult the latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) for specific information.

PART 2 PRODUCTS

2.01 GENERAL

The components of this roofing system are to be products of Versico. The installation, performance, or integrity of products by others is not the responsibility of Versico and is expressly disclaimed by the Versico Warranty.

2.02 VERSICO LiveRoof® MODULE SPECIFICATIONS

LiveRoof modules are black in color and formed with 100-mil thick (sidewall) polypropylene. Modules are pre-planted with growth media and plant species of the color and type desired by the building owner. LiveRoof modules are pre-grown to maturity (95%+ soil coverage). Each tray also contains a Soil Elevator™, an insert collar that allows soil to be packaged above the edge of the module. The Soil Elevator is removed after the modules are installed to promote a continuous media appearance. Physical properties are as follows:

Element	Description
Depth of Standard Modules	3-1/4"
Soil Depth	Approx. 4-1/4"
Module Size	1' x 2'
Weight of Planted Modules (fully saturated weights)	27 – 29 lb. per sq. ft., fully saturated
Module Material	100% post industrial recycled polypropylene
Module Clearance above Roofing Surface	0.5"
Color of Modules	Black
Growth Media	Engineered blend consisting of organic and inorganic components.
Required underlayment for modules	Black, 40-mil GeoMembrane slip sheet
Irrigation System	Typically not required for LiveRoof Standard Modules, but recommended for backup during prolonged, hot, dry, windy weather patterns; an overhead irrigation type system is recommended, when specified. An overhead system designed by Spring Brook Supply is recommended.
Plants	See individual grower recommendations for regional selections
Edge Treatment	Wood, recycled composite wood, aluminum, pavers or other specialty materials. Co-engineered Permaloc® non-fastened, aluminum, L-shaped edging is recommended.

2.03 RELATED VERSICO MATERIALS

- A. For use with **VersiGard EPDM membrane** – G200SA Yellow Substrate Adhesive, VersiGard QA Seam Tape, Primer, Lap Sealant, Cured EPDM Flashing, Pressure-Sensitive Flashing, T-Joint Covers, Uncured Flashing, Fasteners/Plates, Water Cut-Off Mastic, Pourable Sealer, Pre-Molded Pipe Seals, Pressure-Sensitive Inside/Outside Corner, Pourable Sealer Pockets, and Termination Bars.
- B. For use with **VersiWeld TPO membrane** – VersiWeld Bonding Adhesive, Cut-Edge Sealant, reinforced and non-reinforced flashing, Water Cut-Off Mastic, PT 304 Sealant, Molded Pocket Sealant, Weathered Membrane Cleaner, Pre-Molded Pipe Seals, Split Pipe Boots, Curb Wrap Corners, and Termination Bars.
- C. **40-mil GeoMembrane Slip Sheet (black)** – a heat-weldable, non-reinforced, polypropylene sheet designed for liners in potable water and industrial containment applications. The membrane is specifically formulated for long-term use in buried or exposed geomembrane applications. Available in rolls 12' wide by 100' long.
- D. **Other Versico products**, such as insulation and edgings/copings, are also required when such components are to be included as part of the System Warranty.

2.04 GROWTH MEDIA PROPERTIES

The Growth Media mix provides stable soil structure, high porosity, and high moisture holding properties. The growth media also provides excellent drainage while remaining lightweight. LiveRoof® media is an engineered blend of inorganic and organic components based upon the fine side of German FLL guidelines modified so as to contain ecologically sustainable levels of organic content. LiveRoof® specified engineered soil is 93+% (by dry weight) inorganic content for minimal shrinkage/decomposition.

2.05 PLANTS

LiveRoof recommended design mix of highly drought resistant ground covers that can thrive in an extensive/shallow environment based on the project location. Local horticulturists should be consulted for specific recommendations.

- A. Planting density: 95% coverage at the time of shipment.
- B. Special Order: Specific plantings that meet the climate zone and the desired look the roof garden is to achieve. Special patterns may be accomplished with various plant species to give a pattern look for color, plant height, etc. This is accomplished by coordinating a specific design with the owner/architect and LiveRoof grower.

2.06 EDGE ELEMENTS

Consisting of aluminum with perforations for drainage for placement at exposed edges of the modules. Edging is 4.5" x 3", with a minimum gauge of 210-mil. LiveRoof recommends co-engineered Permaloc[®] non-fastened, perforated aluminum, L-shaped edging.

- A. Edging is required for use between modules and stone ballast.
- B. Edging is preferred, but not required, for use between modules and concrete, recycled glass, or rubber pavers.
- C. If walkway pads are used in place of pavers, use 10 x 16 x 1" wafer head self-tapping screws to affix edging to the modules to prevent slippage.

2.07 "HARDSCAPE" ITEMS (optional)

- A. **Individual concrete plaza pavers** – 2' x 2' x 2" thick precast concrete pavers weighing a minimum of 18 psf with a minimum compressive strength of 6500 psi.
- B. **Paver Pedestals** – Rubber paver pedestals to elevate the surface of the pavers above the roof membrane and promote positive drainage and protection from freeze/thaw.
- C. **Versico Rubber Paver** – A 2' x 2' x 2" thick rubber paver weighing approximately 24 pounds per unit (6 pounds per square foot) manufactured from recycled rubber, which provides a resilient, shock absorbing, weather resistant surface. Available in colors of terre cotta (red) and black. Optional sizes and colors are also available.
- D. **Stone Ballast** – Nominal 1-1/2" diameter rounded water worn gravel which conforms with ASTM D448, gradation size #4, applied at a minimum of 10 pounds per square foot. Used around roof drains **and along walls as a transition from the modules and to promote drainage.**

PART 3 EXECUTION

3.01 GENERAL

- A. Refer to Versico's specifications for specific requirements concerning membrane adhesion and splicing criteria, insulation type and securement methods, product delivery, storage and handling guidelines, and applicable installation of all materials and details.

Note: Overlayment of field membrane splices will not be required when splices are shingled to avoid bucking of water. If field splices will buck water or if they are located in areas of ponded water, they shall be overlaid. Use 6" wide VersiGard Pressure-Sensitive Cured Cover Strip for VersiGard EPDM and 6" wide VersiWeld Pressure-Sensitive Cover Strip for VersiWeld TPO membrane.

- B. Flashing/detailing at walls, curbs, skylights and all other penetrations through the membrane must be flashed in accordance with Versico's published specifications/details for the applicable membrane specified.

3.02 INSTALLATION OF 40-MIL GEOMEMBRANE SLIP SHEET

Installed prior to installation of the LiveRoof modules and after Versico's inspection of the membrane system.

- A. **Sweep** all debris, foreign material, etc. from the membrane surface.
- B. **Unroll 40-mil GeoMembrane Slip Sheet** directly over the membrane and provide a minimum 2" side and end overlap. When VersiWeld TPO membrane is used, Geomembrane sheets shall be field welded a minimum of 1-1/2" in width using a Heat Welder. As an option for VersiGard EPDM membranes, QA Seam Tape/V-150 or LV-600 Primer can be used to splice adjoining slip sheets.
- C. **Extend** GeoMembrane up walls, curbs, etc. to the height of the top of the growth media layer.
- D. Under windy conditions, provide temporary ballast to prevent wind disturbance. It is recommended to install the additional LiveRoof modules over the GeoMembrane soon after its placement to prevent disturbance.

3.03 APPLICATION OF LiveRoof MODULES

Unless otherwise accepted by Versico, LiveRoof modules shall be installed between April 1st and October 15th, but not when the temperature is below freezing temperatures.

- A. **Remove** all debris from the slip sheet surface.
- B. **Remove** any plastic wrap from the modules to prevent from overheating in the sun.
- C. Installation of the Versico LiveRoof modules shall follow the installation of any irrigation system, pavers, ballast, and edging.
- D. Versico LiveRoof module rows shall be straight, modules shall be tight against each other, arranged in proper directional orientation, and Soil Elevators™ removed only when individual modules are completely surrounded by edging or other LiveRoof modules, so as to prevent soil spillage.

Note: If the biodegradable Soil Elevator is used, then the Soil Elevator™ should remain in place.

- E. The installation of the Versico LiveRoof modules shall be conducted in accordance with the applicable landscape design.
- F. **Place** LiveRoof modules over the slip sheet in the desired locations as indicated on the shop drawings.

Note: Care must be exercised when placing modules to avoid damaging the slip sheet or underlying membrane. **Do not drag** modules into position. Modules must be **lifted** and gently positioned. **Do not set** LiveRoof modules on top of soil, dirt, or grit. Sweep protective membrane clean in advance of placing each LiveRoof module.

- G. Do not install modules over saturated roof surfaces or under freezing conditions.
- H. Any custom fitting and cutting against edgings or parapets must also include the underlayment of the LiveRoof module (40-mil GeoMembrane slip sheet) along with an appropriate drainage fabric/media filter. The drainage fabric must be placed under the altered module and tight across the face of the cut module (equal to the top of module) and placed tight against the surrounding parapet or edge treatment.
- I. After installing the modules, they should be watered immediately to thoroughly moisten the planting media from top to bottom.

Note: Approximately 1 inch of water or 1-1/2 gallons of water is needed per module to moisten each module thoroughly.

3.04 MAINTENANCE

Maintenance is the responsibility of the building owner. There are maintenance services that can be arranged by Versico, or the owner may choose to use an outside firm or their own staff. In all cases, the requirements outlined below must be followed:

A. Documentation

Record all green roof maintenance events. Include name of person, date and activity.

1. If fertilizer, record type and amount applied per 1000sf
2. If soil test, record lab
3. If irrigation, duration and quantity

B. Annual Maintenance

1. Soil Testing and Fertilization.

During April 1 to 15 of each year, administer an annual soil test for PH and fertility levels.

- a. Maintain pH in the range of 6.5 to 8.0. In the event that pH is outside of the 6.5 to 8.0 range, consult LiveRoof, LLC for the appropriate amendment.
- b. Maintain fertility in the normal range using a typical field soil fertility test as provided by A&L labs. When indicated, apply a single springtime application of Nutricote 14 14 14, Type 180 (180 day release period), at 20 lbs per 1000 sf. Follow the Nutricote labeled directions for application rate, which take priority over any recommendations listed here. Runoff potential does exist and should be evaluated by the applicator in accord with the site specifics; the greater the runoff sensitivity, the lower the application rate. All applications of fertilizer are the sole responsibility of the applicator.

C. Irrigation

1. Watering

While in northern North America, successive watering may not be needed to keep your LiveRoof® alive; however, protracted hot dry weather can result in plant thinning or death. In warmer climates, depending upon rainfall and exposure, regular irrigation will probably be required. Accordingly, LiveRoof® recommends irrigation, in a manner practical and efficient for the scale of the installation, as a “temporary” management tool under the following conditions:

- a. **Prolonged hot dry weather**, in the northern temperate zone, is generally defined as periods of 75-degree weather, with less than 1" of rainfall persisting for 4 weeks or longer. This time period will likely be less if the temperatures are hotter, the climate warmer, on sloping rooftops, or roofs exposed to strong winds. Such conditions can dry out the green roof substrate and cause the plants to go dormant or in extreme cases to dry up and die. Dormant plants tend to shrink to a smaller size and expose soil, which can predispose the system to weed encroachment.

When hot dry weather persists for greater than 4 weeks, irrigation is to be applied, temporarily, to re-wet the soil to the point of runoff.

NOTE: There are no absolutes when it comes to irrigation. Check the plants for wilting in the morning rather than midday. Irrigate if the plants show signs of wilting in the morning.

- b. In **areas of reflected light**, such as next to south facing walls, more frequent irrigation should be applied to keep the soil from becoming excessively dry.

D. Inspections and Plant Care Protocol

Conduct the following EVERY 2 WEEKS (twice per month) during the entire Spring through Fall Growing Season. Conduct year round in climatic regions where the LiveRoof does not freeze in winter.

1. Conduct hand weeding during the bimonthly inspection. Pull all weeds, never allow any weed to flower, set seed and complete its life cycle.
 - a. The interval may be adjusted in accord with seasonal variations in weed growth, but the interval should never exceed 2 weeks or long enough to allow for weeds to flower and set seed.
 - b. Never allow a woody plant to establish in a green roof system as their root systems are extensive and can damage roof membranes.
 - c. Herbicides, whether pre-emergent or post-emergent, are not recommended as they are not healthy for the environment and can contaminate runoff. A need for pre-emergent herbicides is a sign of weeding too infrequently.

2. Displaced Soil

Any soil displaced, typically due to nesting birds, should be immediately replaced with LiveRoof Engineered Green Roof Soil.

3. Drainage Inspection

Roof drains should be cleared of any debris, pebbles, leaves, etc. during the twice-monthly inspection to keep drains flowing freely.

4. Debris / Trash Removal

Remove immediately debris or trash during bimonthly inspection. Especially during fall and spring, rake LiveRoof® planting clean of any matted tree leaves to prevent smothering.

5. **Pesticides**

Pesticide use is discouraged and should always be considered secondary to cultural and biological control measures, as pesticides can get into runoff water and cause environmental damage. Pesticide use should only be conducted by qualified and licensed applicators, and on an “as needed” basis. All applications of pesticides are the sole responsibility of the applicator.

6. **Mowing**

Once annually, around April 1, mow the green roof to a height of 2" or less. The clippings should stay on the roof. Do not bag and remove. As an option, the owner may elect to forego the mowing. USE PROTECTIVE EQUIPMENT.

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Review the appropriate Versico warranty for specific warranty coverage, terms, conditions, and limitations.