



Xero Flor Pre-Cultivated Vegetation Mat Green Roof System Specifications

PART I - GENERAL

1.1 Summary

- A. This document is to be included as a separate section in **DIVISION**_____. It is intended as a guideline for materials function and assembly instruction. The green roof materials assembly is subject to modification as needed for each specific project.

1.2 Definitions

- A. **Root Barrier:** A flexible, synthetic polymer layer installed below the green roof system that serves as protection against root encroachment into underlying roof components.
- B. **Drainage Mat:** A composite geotextile that creates a free flowing space below the vegetated and retention fleece layers to permit unrestricted movement of excess water to roof drains.
- C. **Retention Fleece:** A non-woven fabric layer to serve as filter fabric against particle erosion and to retain supplemental water for root uptake and plant use. A lightweight fleece is part of the pre-cultivated XF301 vegetation mat (see definition below). One or two additional fleece layer(s) may be used in the green roof system assembly for enhanced water holding capacity.
- D. **Pre-cultivated Vegetation Mat:** An integrated unit of plant material, growing medium, and natural fiber or geotextile carrier. Pre-cultivated mats are harvested fully vegetated from the production field and delivered to the installation site as flat or rolled sheets.
- E. **Growing Medium:** A low-organic / high-mineral composition growing mix composed of composted organic matter and lightweight porous aggregate.

1.3 Related Sections

_____ - _____
 _____ - _____

1.4 Submittals

- A. The manufacturer will provide a cross section of the green roof system to the architect / builder / installer detailing the components comprising the Xero Flor system.

1.5 Deliveries, Storage, and Handling of Material

- A. Xero Flor plant materials shall be delivered in such a manner to preserve the quality of the plants. Truck delivery must protect the vegetation mats from temperature or wind damage during transport, such as use of plant-compatible tarp covers. Closed or open trailers may be used for transport times less than one day. For longer duration transport times, vegetation mats must be delivered in a climate controlled trailer. Upon arrival, the mats shall be immediately off-loaded, plastic wrap removed (if used), and installed within twelve hours. If timely installation is not achievable, then a holding area shall be reserved to unroll and store the mats until installation.

1.6 Vegetation Coverage Guarantee

- A. Xero Flor mats shall be delivered with a minimum of 80% vegetation coverage at the time of installation and achieve a minimum of 90% coverage after the second full growing season.



PART II - PRODUCTS

2.1 XF112 or XF112P Root Barrier

- A. A flexible polymer sheet installed on top of the roof membrane and below the other green roof components. The standard Xero Flor XF112 root barrier is a water-impermeable sheet of 20mil low density polyethylene (LDPE), though may be increased to 30mil (XF113) or 40mil (XF114) thickness as specified by the membrane supplier and/or project designer.

The water-permeable, polypropylene XF112P root barrier may be used to avoid vapor trapping for inverted roof membrane assemblies (IRMA), when recommended by roof component suppliers. When using the XF112P, it is essential to overlay the root barrier with the XF108H drain mat to assist with “air pruning” of roots below the vegetated layer.

2.2 XF108H Drain Mat

- A. A layer of flexible, non-woven, entangled polymeric filaments with a perforated, geotextile filter-fabric bonded to one side.

2.3 XF157 Water-Retention Fleece

- A. A fabric produced from a blend of recycled, synthetic fibers with a saturated weight of not more than 1.5 psf.

2.4 Pre-cultivated Vegetation Mat

- A. XF200 is a nature fiber mat filled with a thin-layer of growing medium and pre-cultivated with an even layer of low-profile, drought-tolerant vegetation. Mat thickness 3/4”, field weight 3.5 psf, saturated weight 5.0 psf.
- B. XF300 is a textile-based vegetation carrier of PA/PP entanglements bonded to geotextile fabric filled with a thin-layer of growing medium and pre-cultivated with an even layer of low-profile, drought-tolerant vegetation. Mat thickness 1”, field weight 5.0 psf, saturated weight 7.5 psf.
- C. XF301 is a textile-based vegetation carrier of lightweight fleece sown to PA/PP entanglements bonded to geotextile fabric filled with a thin-layer of growing medium and pre-cultivated with an even layer of low-profile, drought-tolerant vegetation. Mat thickness 1 1/4”, field weight 5.5 psf, saturated weight 8.5 psf.

2.5 Xero Terr Growing Medium

- A. A proprietary mixture of lightweight, mineral based materials; including porous aggregate and organic matter derived from composted plant materials, biosolids, and/or manure compost.

2.6 Hose Bib / Water Supply

- A. A spigot source or other means of supplying water to the roof with sufficient pressure is required. Irrigation must be applied during the plant recovery phase, e.g. first 1-2 weeks, after installation. In order to support mature establishment of the vegetated community, it is highly recommended that periodic irrigation be applied during the hottest months of the 1st and possibly 2nd growing



seasons after installation. The method of supplying irrigation may vary with regard to removable or permanent piping, rotary heads, drip irrigation, or other approved irrigation technologies.

PART III - EXECUTION

3.1 General

- A. All green roof system components, including irrigation if specified, are to be installed by certified contractors with demonstrated experience and project references. The various layers shall be installed in such a manner as to not damage or disturb any previously installed roofing components. Installing the system in any manner inconsistent with manufacturer guidelines voids all guarantees and warranties.

3.2 Inspection

- A. Underlying roof components (deck, vapor barrier, insulation, waterproofing membrane, etc.) shall be installed and tested according to manufacturer guidelines. The surface of the roof shall be swept free of debris prior to installing the green roof system.

3.3 Root Barrier

- A. Install the XF112 (or other approved) root barrier loose-laid with minimum 12" (30cm) overlap onto adjacent root barrier material. Root barrier roll ends are to be staggered to avoid creating a continuous, perpendicular seam for adjacent rolls.

3.4 Drain Mat

- A. Install the XF108H drain mat with the nylon entanglement facing down and geotextile fabric surface facing up. One edge of the roll has a 4" extension of geotextile material, which is designed to overlap the adjacent drainage mat. Adjacent drainage mat rolls should be staggered during installation to avoid a perpendicular seam.

3.5 Retention Fleece

- A. Install the XF157 water retention fleece on top of the drainage layer with either side facing up. Adjacent rolls of fleece may be aligned tightly abutted against or slightly overlapped (~1") onto the previously installed fleece layer. Ends of adjacent rolls should be staggered at least 6 ft during installation to avoid continuous perpendicular seams.
- B. When overlaying fleece with supplemental growing medium (see section 3.6), overlap adjacent rolls of fleece 4" to prevent erosion of growing medium into the underlying drainage layer.

3.6 Xero Terr Growing Medium

- A. For enhanced water retention and plant support, three-quarters inch (3/4") to as much as two and a half inches (2 1/2") XeroTerr growing medium may be spread onto the fleece layer, thoroughly wetted, and overlaid with precultivated Xero Flor vegetated mats.
- B. For sloped installations utilizing approved slope retention hardware or in locations with extreme hot or dry climates, supplemental XeroTerr growing medium may be used at depths up to 4". Consult Xero Flor America representatives for appropriate circumstances to exceed depths of supplemental growing medium greater than 2 1/2" below the installed Xero Flor mat.



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Note: In the absence of border pavers or metal retention edging, avoid placement of supplemental XeroTerr medium along the outer 6" – 9" perimeter of the green roof base components.

3.7 Pre-cultivated Vegetation Mat

- A. Immediately prior to installation of the vegetation mat layer, base component layers must be thoroughly saturated with water. Failure to saturate green roof system base layers will result in severe stress to the root system and harm to the mat vegetation.
- B. Pre-cultivated Xero Flor mats are supplied with a minimum of 80% vegetation coverage and delivered either as rolled or flat sheets on pallets.

Xero Flor mats are pre-cultivated with mixtures of proven green roof plant species selected for climate compatibility within the geographic range of each production field. The relative proportion, final makeup, and appearance of individual species will vary among individual mats within a shipment and after plant community development in a roof installation.

- C. Each vegetation mat section has an exposed 4" wide strip of non-vegetated fabric to be overlapped by the adjacent vegetation mat. Each row of adjacent vegetation mats should be staggered by half the length of an individual mat to avoid alignment of end seams across rows.
- D. Upon complete installation of the mats, it may be necessary to redistribute and/or provide additional growing medium to ensure even coverage across the carrier mat. Along mat edge seams or wherever growing medium was lost from mats during transport and handling, apply top-dressing of supplemental Xero Terr growing medium to support vegetated fill-in.
- E. For ballasted green roof systems, such as high-elevation surfaces or protected roof assemblies (also termed: inverted roof membrane assemblies), washed river stone (3/4" – 1 1/2" dia) may be overlaid on the installed vegetated Sedum mat. Recommended load rates are 3 to 5 lb/sf, which are equivalent to a single-layer of stone covering approximately 60% to 95% vegetated mat surface area, respectively.
- F. The assembled vegetation mat system must be thoroughly watered immediately after installation to assist with settling of individual components and to support recovery and establishment of the system vegetation.

3.8 Roof Edges, Drains, and Other Penetrations

- A. A minimum gap of 18" must be used between vegetation mats and parapet walls. A minimum gap of 12" must be used between vegetation mats and the roof edge or roof penetrations, such as drains and vents. The drainage mat and single fleece base layers should be installed abutting a fixed boundary, such as a metal edging, stone, or paver. Washed river stone (3/4" – 1 1/2" dia.) or concrete paver blocks are placed onto green roof system base components in the non-vegetated border areas as required by drain locations and design goals.

3.9 Roof Repairs

- A. The Xero Flor green roof system must not be adhered or otherwise affixed to the constructed roof in any manner, thereby allowing access for roof repairs or modifications by rolling back or removing the vegetation system components.