Specification - Xero Flor® XF300 Pre-Cultivated Vegetation Mat Green Roof System – Standard Build Up

PART 1 GENERAL

1.1 Summary

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 specific project design is subjected to modification as needed for each specific project, such as increasing the water retention capability of the system as permitted by the structural load bearing capacity.

1.2 Definitions

A. Root Barrier: A water impermeable, flexible layer below the green roof system that serves as protection against root encroachment into the underlying roof components.

B. Drainage/Filter: A composite material that creates sufficient space below the vegetated and water retention layers to facilitate movement of excess water to roof drains while restricting particulates from clogging the drainage path.

C. Water-Retention Fleece: A non-woven fabric material that helps to contain particulate materials and retain water for root uptake and plant use. A lightweight fleece is part of the pre-cultivated vegetation mat (see definition below). Additional water retention layers of fleece or roll can be incorporated into the green roof system to increase water retention capacity.

D. Pre-Cultivated Vegetation Mat: A flexible combination of plants, planting substrate and synthetic fabric carrier. Pre-cultivated mats are harvested from the field fully vegetated and delivered to the installation site as sheets or rolls.

E. Growing Medium: A low-organic/high-mineral composition growing mix composed of porous aggregate, sand, minerals and organic matters.

1.3 Related Sections

____ - Irrigation
____ - Roofing System
____ - _____

1.4 Description

Deliver and install a Xero Flor® pre-cultivated XF300 sedum green roof system on a low-slope roof (up to 5%) provided by Chatfield Farms Green Roofing, Elbridge, NY 13060, (315) 466-2162.

- Sedum mats must be planted, grown, harvested and maintained in the USA and within 350 miles of the project site.
- Growing Media shall originate within the continental USA and not more than 350 miles from project site.
- Certification must be submitted and a sworn affidavit shall be supplied along with planting location, duration of planting, location of media blending facility, etc.. to certify USA origination within 350 miles of project site.

1.5 Submittals

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

1.6 Quality Assurance

A. All Xero Flor® green roof systems meet the FLL Guidelines for the Planning, Execution and Upkeep of Green-roof Sites and are installed by certified contractors with demonstrated experience and project references.

B. The wind uplift resistance of the Xero Flor® green roof system has been tested and determined to CSA A123.24-15 “Standard test method for wind resistance of modular vegetated roof assembly” and has a rating of 104 MPH.

C. The fire spread resistance of the Xero Flor® green roof system has been tested to DIN 4102 part 7 “Resistance against spread of flame and radiant heat”.

1.7 Delivery, Storage, and Handling of Material

A. Pre-cultivated plant material shall be delivered in such a manner as to preserve the quality of the plants. Truck delivery will be conducted in a manner to protect the vegetation mats from temperature or wind damage. For transport times less than 1 day, a closed or open trailer may be used. For longer duration transport times, vegetation mats shall be delivered in a climate-controlled trailer (e.g. refrigerated container). Upon arrival, the mats shall be immediately off-loaded, plastic wrap removed (if used), and installed within 12 hours. If timely installation is not achievable, then a holding area shall be reserved to layout and store the mats until installation.

B. Non-living components such as root barrier, drainage/filter and water retention layers shall be kept dry and protected from the elements (e.g. cover with a water-resistant tarp) while storing on site.

1.8 Vegetative Coverage Guarantee

The vegetation shall be sufficiently pre-established to provide a minimum of 80% vegetation coverage on average at the time of installation and minimum of 90% vegetation coverage on average after the first full growing season.

PART 2 PRODUCTS

2.1 XF110 Root Barrier

A physical root barrier made of low-density polyethylene. Thickness: 10-20 mils. Install on the roof membrane and below the other green roof components.

2.2 XF108 Drainage/Filter Layer

A drainage core made up of three-dimensional flexible matting of looped polymeric filaments with a perforated nonwoven geotextile filter fabric thermally bonded on one side. The looped filament drainage core provides an open structure for excess water flow while the filter layer restricts particulates from clogging the drainage path. Thickness: .6". Water-saturated weight: 0.08 lbs/sf. Water retention: 0.10 lbs/sf. Water retention: .01 gals/sf. Water retention: .02"

2.3 XF159 Water Retention Fleece

A fabric produced from a blend of 100% recycled polymeric fibre, mechanically bonded without any chemical or thermal treatment. Thickness: .4". Water-saturated weight: 1.48 lbs/sf. Water retention: 1.28 lbs/sf. Water retention: .15 gals/sf. Water retention: .25"

2.4 Xero Terr® Growing Medium - (Based on 1")
A proprietary mixture of lightweight mineral based materials and organic matter specially engineered for green roof planting. It meets the requirements for growing medium in the FLL Guidelines for the Planning, Execution and Upkeep of Green-roof Sites. Dry weight 4.04 lbs/sf. Water-saturated density: 6.84 lbs/sf. Water retention: 2.8 lbs/sf. Water retention: .34 gals/sf. Water retention: .54".

2.5 XF300 Pre-cultivated Vegetation Mat

A flexible vegetation carrier consisting of a three-dimensional flexible matting of looped polymeric filaments attached to a soil retention sheet. The three-dimensional polymer matting is filled with a XF400 Xero Terr® growing medium and pre-cultivated with an even layer of low-profile, drought-tolerant vegetation (such as sedums, delosperma and portulaca). Thickness: 1". Water-saturated weight: 6.08 lbs/sf. Water retention: 2.56 lbs/sf. Water retention: .34 gals/sf. Water retention: .49".

2.6 Ballast

Washed river stones with diameter between 3/4"and 1 ½".

2.7 Edge Restraint

Edge restraints keep media and plants in place while allowing the green roof system to drain. Edge restraint shall be .063" aluminum or 18 gauge stainless steel. Slot size: 2" x .25". Slot spacing: 1" on center. Flow rate: 5.4 gal/min/ft

2.8 Irrigation

An outlet or other means of supplying water to the roof with sufficient pressure is required. Irrigation shall be applied during the first 4-6 weeks after installation depending on the climatic conditions. Periodic irrigation is required during the hottest months of the establishment period and during extreme drought. The irrigation method may vary with regard to removable or permanent piping, rotary heads or drip irrigation, or other irrigation technologies, as well as the irrigation schedule, and is to be determined by the architect, contractor, facility manager and/or the manufacturer. Irrigation shall be applied during drought conditions to supply plants with the water they need to survive.

PART 3 EXECUTION

3.1 General

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 manner as not to damage or disturb any previously installed roofing components. Installing the system in any manner inconsistent with manufacturer guidelines voids all guarantees and warranties. Contact a Xero Flor® representative for guidance if needed.

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.

B. The roof structure must be certified by the structural engineer to have sufficient load bearing capacity to support the water saturated weight of the green roof.

C. The roofing system must be tested for continuity (e.g. flood test or Electrical Gradient Leak Locate test) and certified to be watertight prior to the green roof installation.

3.3 Root Barrier

Install the root barrier loose-laid on the roof membrane with a minimum of 12” overlap. The root barrier rolls shall be installed working out from the drains. Each subsequent roll shall overlap the previous roll by 12” in shingle fashion to facilitate water flow towards the drains.

3.4 Drainage/Filter Layer

Install the drainage/filter layer on the root barrier with the looped polymeric netting facing down and geotextile fabric surface facing up. One edge of the roll has a 4” extension of geotextile fabric, which is designed to overlap the adjacent roll. Cut to fit along the roof edge and around penetrations. The drainage/filter layer shall be covered with the next layer within three days and shall not be exposed to the sun for prolonged period to minimize damage from ultra-violet radiation.

3.5 Water Retention Fleece

A. Install first layer of water retention fleece on top of the drainage layer with a 3” overlap with either side facing up. Each row of adjacent fleece shall be offset by at least 6 feet to avoid alignment of end seams across rows Cut to fit along the roof edge and around penetrations.

B. Install the second layer of water retention fleece on top of the first layer in the same manner. Install the second layer 90° to the first layer if feasible. Otherwise, install the second layer in the same direction as the first layer but offset the top and bottom layers by half the width to avoid alignment of overlaps.

3.6 Pre-cultivated Vegetation Mat

A. Pre-cultivated vegetation mats are supplied to the site either in rolls or in flat sheets and with a minimum of 80% vegetation coverage on average. Vegetated mats are cultivated using plant seeds and stem cutting of a mixture of succulent species. 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.

B. Install the pre-cultivated vegetation mat on top of the water retention layers. One edge of the mat has a 4” extension of a lightweight fleece, which is designed to be overlapped by the adjacent mat. Each row of adjacent vegetation mats shall be offset by half the length of an individual mat to avoid alignment of end seams across rows. Cut to fit along roof edge and around penetrations.

C. Upon complete installation of the mats, it may be necessary to redistribute and/or supplement the substrate to ensure even coverage across the vegetation mat. In areas or along edges where substrate was lost during transport and handling, new substrate must be added to support vegetative growth.

D. Water the assembled vegetation system immediately and thoroughly after installation to assist with settling of individual components and to support recovery and establishment of the vegetation.

3.7 Irrigation System (if necessary)

The installation of the irrigation system shall be carried out by a contractor with not less than two years experience in irrigation system installation.

3.8 Roof Edges, Drains, and Other Penetrations

A. A border of minimum of 12”-18” in width or as per specification shall be kept non-vegetated between vegetation mats and the roof edge, as well as the roof penetrations, such drains and vents.

B. The root barrier shall be installed up to the roof edge or a fixed boundary, such as a metal edge detail, to the system thickness.

C. The drainage/filter layer shall be installed up to the roof edge or a fixed boundary, such as a metal edge detail.

D. The vegetation mat shall be installed up to the non-vegetated border.

E. Round washed river stones of diameter ¾" and 1 ½" or concrete pavers shall be placed in the non-vegetated border around the roof edge and penetrations.

3.9 Repair

The 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.