FTG VRS05/13

GENERAL GUIDE SPECIFICATION FOR INSTALLATION OF

FIBERTITE® GREEN™ VEGETATED ROOFING SYSTEM

FiberTite® Seaman Corporation

INTELLIGENT ROOFING SOLUTIONS

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FIBERTITE ROOFING SYSTEMS

by Seaman Corporation

FTG VRS05/13 may be utilized for membrane roofing/waterproofing for conventional roof deck applications involving extensive and intensive vegetated roofing systems. The FiberTite Green Vegetated Roof System is a single source integrated assembly utilizing FiberTite Roofing Systems and a FiberTite Green Vegetated Assembly. The FiberTite Green Vegetated Roof System may be loose laid, adhered or mechanically fastened as the project dictates and includes all roofing membrane, integral flashing, vegetated system components, engineered soil, plants, leak detection and related accessories as manufactured and supplied by Seaman Corporation.

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PART 1 | GENERAL

1.1 SUMMARY

A. Scope

1. Furnish and install a FiberTite® Green™ Vegetated Roof System as manufactured and supplied by:

   Seaman Corporation
   1000 Venture Blvd.
   Wooster, Ohio 44691
   Tel.: 800-927-8578
   Fax: 800-649-2737

2. FiberTite Roofing System shall be the core waterproofing assembly within the FiberTite Green Vegetated Roof System, including insulation, coverboard, integral flashing, protection layer, drainage medium, engineered growing medium, plants and components as required.

3. The work may include, but is not necessarily limited to:

   a. Roofing Waterproofing System

      i. FiberTite Membrane

      ii. Insulation/Coverboard

      iii. Fasteners

      iv. Membrane Flashing

      v. Sealants and Adhesives

      vi. Metal Flashing

   b. Leak Monitoring System

      i. FiberTite Smartex® EVM

      ii. Stainless Steel ConDuct® Grounding Mesh

   c. Vegetated Overburden – FiberTite Green Multi Layer System

      i. Protection Layer When Specified

      ii. Drainage Layer

      iii. Filter Layer

      iv. Retention Layer

      v. Engineered Growing Media

      vi. Plants

      vii. Metal Edging/Trim Elements

      viii. Irrigation System

d. Vegetated Overburden – FiberTite Green Tray System

- **i.** Double Interlocking Trays
- **ii.** Connectors
- **iii.** Engineered Growing Medial
- **iv.** Metal Edging/Trim Elements
- **v.** Integrated Irrigation System

B. Definitions

1. FiberTite Green Multilayer: patent-pending system includes a drainage layer, filter layer and retention layer, regionally-engineered growing media, specified firewise and firesafe plants, stainless steel or aluminum trim elements. The low profile multilayer system is designed to control flow of water and the drainage layer of the multilayer system is designed to keep the roof structure dry, while providing excellent airflow up through the system and while reducing wind uplift.
2. FiberTite Green Tray System: includes double interlocking trays, connectors, regionally-sourced engineered growing media, specified firewise and firesafe plants, stainless steel or aluminum edgers and integrated irrigation system. Growing media can be placed above level of interlocking trays for thicker beds because of interlocking design. Drainage system is designed to control flow of water and bottom of trays are designed to reduce wind uplift.
3. Extensive Vegetated Roof Systems: are defined as low to no maintenance garden roof systems that incorporate a roofing/waterproofing membrane system that is covered with soil and vegetation in a growing medium that is less than 6" in depth. Extensive systems incorporate the following items within the assembly: deck/substrate, insulation, coverboard, roofing membrane, flashing membrane, sealant and adhesives, metal flashing, protection layer, drainage layer, filter fabric, water retention layer, growing medium and plants/vegetation.
4. Growing Media: the engineered growth media and selection of appropriate vegetation is critical to the system's performance and must be properly engineered for each application. Seaman Corporation will arrange engineering for the vegetated system for a full-service, single-source system warranty.
5. Phytroemediation: use of green plants to extract pollutants, mineral elements, heavy metals, radioisotopes and other contaminants from soil and water environments.
6. German FLL Greenroof Guidelines: Guidelines for the Planning, Execution and Upkeep of Green Roof Sites, Release 2002. Worldwide acknowledged state-of-the-art technology as scientific foundation for successful and thriving green roofs.
7. Electronic Vector Mapping (required for all single-source warranties): EVM pinpoints breaches through a waterproofing membrane by creating a positive and negative electrical plate over and under the non-conductive waterproofing membrane. If there are any penetrations in the waterproofing, current will flow through the membrane and the exact location detected with the testing equipment.

C. Special Conditions

1. This specification is applicable to only those building roofs that have decking of sufficient structural integrity, capable of supporting the loads associated with this type of installation according to the guidelines set forth herein, and specific system addenda included by reference in Section 1.2.
2. All applications and project specifications require review by FiberTite Technical Customer Services (FTCS) for acceptance prior to any commitment to provide a commercial warranty.
3. Seaman Corporation FiberTite Pre-Installation Notice (FTR-PIN), must be completed, signed by an authorized roofing contractor, submitted to and approved by FTCS before any consideration for warranty and/or the release of any materials can be authorized.

D. Special Design Considerations

1. The building owner shall submit an engineering study or Statement of Sound Roof Structure to FTCS, indicating that the structure is able to accommodate additional live and/or dead loads including vegetated overburden, snow and water retention.
2. Moisture conditions in existing roof(s), new structural concrete or new lightweight insulating concrete that would impair or prohibit the desired performance of the new roof system.
3. Positive slope to promote adequate drainage to avoid the potential damage to the substrate or components.
4. Roof areas subject to heavy or excessive mechanical traffic shall be designed with proper access paths.
5. All FiberTite Green Vegetated Roof Systems require an approved coverboard over the roof system insulation, directly beneath the vegetated overburden.
6. This specification does not provide building code or jurisdiction acceptance as to wind, fire, etc as they relate to a Vegetated Roof System.
7. Supply rooftop water source for irrigation system.
8. Conform to project landscape design requirements, recommendations of local horticulturists where possible and requirements of authorities having jurisdiction, including Fire Marshal for specific recommendations and regulations.

E. Environmental Considerations

1. Severe environmental exposure (e.g. coastal or high wind area(s)).
2. Chemical discharge not listed on the Seaman Corporation/FiberTite chemical resistance publication.
3. Environmental conditions such as fog, dew, rain or snow and/or freezing temperatures can have a detrimental effect on the application and performance of adhesives.

4. Compliance with EPA and OSHA requirements as published by local, state and federal authorities.
5. All adhesives can be described as temperamental. The contractor must be aware of all potential environmental variables when installing adhered roofing systems.
6. Pay particular attention to and follow all adhesive storage and application precautions/guidelines.
7. Do not apply/use waterborne adhesives (FTR 490 or FTR 390) if the ambient air temperature is expected to drop below 32°F (0°C) within 48 hours of application.
8. Ambient Air Temperature: Install plant materials in the FiberTite Green Vegetated Roofing System preferably between April 1 and November 1 at temperatures between 40°F and 95°F (at northern latitudes). Do not install if extended freezing temperatures are expected or if ambient soil temperature is expected to remain below 50°F.

1.2 REFERENCES

A. FiberTite FTR GS0 2/13 General Guide Specification for Installation of FiberTite Roofing Systems

B. FiberTite FTR MA02/13 General Guide Specification for Mechanically FiberTite Roofing Systems

C. FiberTite FTR AD 02/13 General Guide Specification for Adhered FiberTite Roofing Systems

D. FiberTite Construction Details

E. FiberTite Green Construction Details

F. ASTM E2400-06 Standard Guide for Selection, Installation and Maintenance of Plants for Green Roof Systems

1.3 QUALITY ASSURANCE

A. FiberTite Green Vegetated Roofing System, inclusive of the vegetated overburden shall be installed only by a roofing contractor, authorized by Seaman Corporation to install FiberTite Roofing Systems prior to bid and/or contract award. Herein, the term Authorized FiberTite Roofing Contractor is synonymous with authorized, roofing contractor and/or contractor.

B. Primary materials for FiberTite Green Vegetated Roofing System shall be obtained from Seaman Corporation and be FiberTite Brand.

C. All Vegetated System components shall be FiberTite Green and obtained from Seaman Corporation

D. Roofing contractor's key personnel shall have received specialized training in the installation of FiberTite Roofing System.

E. FiberTite Roofing System shall be installed in accordance with the most current guide specifications and details as amended and/or authorized by FTCS for specific project requirements.

F. There shall be no deviations from approved contract specifications or shop drawings without prior written approval by the owner/owner representative and FTCS.

G. Unauthorized deviations may subject the roof system to warranty ineligibility.

H. Installation of FiberTite membrane, insulation, integral flashing, FiberTite Green multi-layer or tray vegetated components shall be the responsibility of the authorized roofing contractor to ensure undivided responsibility.

I. Any and all work found to be substandard or in violation of the contract documents or manufacturer's specifications shall be subject to rejection including complete removal and replacement with new materials at the expense of the contractor.

J. A quality assurance inspection of the roof system shall be performed by FTCS for acceptance and approval. This inspection shall be performed upon completion and certification by the contractor that the FiberTite Roofing System has reached 100% completion, a quality installation has been completed in accordance with the approved contract specifications, and all field welds have been probed and inspected.

K. The Quality Assurance Inspection must be coordinated prior to the installation of the above membrane vegetated system components and all field seams shall be visible and available to FTCS at the time of final inspection.

L. Flood Test: Conduct 24-hour flood test of the completed membrane roof system prior to installation of FiberTite Green components.

M. Electronic Vector Mapping (EVM) Leak Detection Testing of the completed FiberTite Roofing System is required for all single source material and labor warranties. The testing must be accomplished in the presence of FTCS or an authorized representative appointed by Seaman Corporation. Written confirmation and acceptance of the test results by all parties shall follow the testing.

1.4 SUBMITTALS

A. The following information shall be submitted to FTCS for review before warranty consideration, material shipment or acceptance can be confirmed.

1. Complete copy of project architectural specifications or roofing contractor's proposal outlining design parameters.
2. Complete list of accessories or materials not manufactured or expressly authorized for use in FiberTite literature.
3. Dimensioned outline of the roof indicating all FTR-Detail references.
4. Dimensioned shop drawings illustrating non-FiberTite details. Details that do not conform to standard FiberTite or FiberTite Green details shall be returned with appropriate recommendations.
5. Acceptance of the structural loading by a qualified engineer or design professional.

B. At the time of contract award, the roofing contractor shall submit to the owner or owner's representative the following:

1. Most recent published technical literature and guide specifications issued by FTCS.
2. Roofing contractor's approved copy of submittal form FTR-PIN.
3. Dimensioned shop drawings, including roof plan detailing perimeter enhancement, flashing methods, terminations and acceptance by FTCS.
4. Written approval from FTCS confirming any accessories submitted, not manufactured or expressly approved in FiberTite literature are acceptable and compatible with the proposed FiberTite Membrane Roofing System.
5. Material Safety Data Sheets (MSDS) relating to all products, chemicals and solvents.
6. Certification that the system specified complies with all identifiable building code and insurance requirements.

C. FiberTite Green Vegetated Roof System

1. Submit shop drawings indicating plan layout and details at critical terminations of garden roof system with adjacent construction. Include planter system, pavers and building systems.
2. Product Data
   a. Vegetated roofing system, components, growing media type and planting types with descriptive published data indicating characteristics and limitations.
   b. Include standard details, system components and proposals for plant types and characteristics.
3. Maintenance Instructions for owner maintenance of planting media as needed for long-term propagation and health of vegetation. Include special provisions as applicable for specific plant media and climate zone.

1.5 DELIVERY & STORAGE

A. Membrane Roofing System

1. Deliver all materials to the job site in manufacturer's original, unopened containers, with legible labels and in sufficient quantity to allow for continuity of work.
2. Select and operate material handling equipment in a safe manner, guarding against damage to existing construction or newly applied roofing and conforming to manufacturer's recommendations of handling and storage.
3. All rolls of membrane shall be stored lying down, elevated above the roof deck, and completely protected from moisture with tarpaulins. Manufacturer's packaging is not considered adequate for outdoor storage.
4. Insulation and cover board materials shall be elevated on pallets and fully protected from moisture with tarpaulins. Manufacturer's packaging is not considered adequate protection from moisture.

5. All adhesives and sealants shall be safely stored between 50°F and 80°F prior to use.
6. Flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow all precautions as outlined in manufacturer's MSDS.

B. Vegetated Garden System

1. Maintain health of plant media as recommended by nursery guidelines prior to rooftop installation
2. Take measures to locate and spread loads in manner to not exceed load bearing capacity of the roof deck
3. Store vegetated planters and materials over plywood panels or protective sheeting and do not allow products, growing medial, grit, debris and pedestrian traffic on unprotected roofing membrane.
4. Provide water source of irrigation and maintenance of plants until permanent drip irrigation system is in place.

C. Materials, determined by the owner/owner's representative to be damaged, shall be immediately removed from the construction site and replaced at no cost to the owner.

1.6 JOB CONDITIONS

A. Safety

1. Take all necessary precautions regarding worker health and safety when using solvents, adhesives and/or hot asphalt.
2. Worker safety is paramount.
3. FiberTite is slippery when wet or exhibits dew, frost, ice or any other form of moisture.
4. Comply with all OSHA requirements for roof construction and fall protection where required.
5. Store flammable liquid and materials away from open sparks, flames and extreme heat.
6. Take necessary precautions when using solvents and adhesives near fresh air intakes.
7. Daily site cleanup shall be performed to minimize debris and hazardous congestion.

B. Protection

1. Schedule installation sequence to limit access and utilization of the newly installed membrane for material storage, construction staging, mechanical and/or excessive foot traffic.
2. Provide proper protection on all newly completed roofing to avoid damage to the new roofing system.
3. Traffic should be minimized on a freshly laid roof.

4. Protect building walls, rooftop units, windows and other components during installation.

C. Additional Precautions

1. Adverse weather conditions (e.g. extreme temperature, high winds, high humidity and moisture) could have a detrimental effect on adhesives, general production efforts and/or the quality of the finished installation. Contact FTCS for recommendations and acceptable tolerances.
2. Daily production schedules of new roofing shall be limited to only that which can be made 100% watertight at the end of the day, including all flashing and night seals.
3. All surfaces to receive new roof system, including insulation and flashing, shall be free from all dirt, debris and be thoroughly dry.
4. Comply with local EPA requirements as published by local, state and federal authorities.
5. All construction debris shall be removed from the construction site and legally dispose of off site.

1.7 COORDINATION

A. Prior to installation of materials, a pre-roofing conference shall be held with the roofing contractor, and owner/owner's representative(s) to discuss the specified roofing system, coordinate its proper application and the expectations of all parties involved. The authorized roofing contractor and the owner/owner's representative shall notify all parties a minimum of fourteen days prior to the meeting.

B. Plan and coordinate the installation of the roofing system with other trades in such a manner to avoid membrane damage, keeping the complete installation weather tight and in accordance with all approved details and warranty requirements.

C. FTCS shall be available to make recommendations necessary to ensure compliance with project specifications and specification alternatives due to unforeseen job conditions.

D. Field services are provided at the discretion of Seaman Corporation. A minimum two weeks' notice is required to evaluate and coordinate any request for on site technical assistance.

1.8 WARRANTY

A. Inspections

1. A FTCS representative shall inspect the completed FiberTite Roofing installation, and upon acceptance, Seaman Corporation shall issue the pre-authorized warranty, subject to the terms and conditions of the sample warranty and contract documents.

B. Available Warranties

1. Seaman Corporation offers the following FiberTite Membrane Roofing System warranties:
    a. Material Warranty: provides the building owner protection against the cost of repairing defects in the membrane only. This warranty is offered at no cost to the owner.
    b. Standard Warranty: provides the building owner protection against the cost of repairing leaks as a direct result of either defects in the membrane or the workmanship involved in its installation for a period of ten (10) years. There is a nominal premium.
    c. Extended Warranty: provides the building owner protection against the cost of repairing leaks as a direct result of either defects in the membrane or the workmanship involved in its installation beyond ten (10) years. There is an additional premium.

C. Single Source Warranty

1. Seaman Corporation offers a Single Source Warranty inclusive of the membrane roofing system and overburden removal of the FiberTite Green Garden Roof under the following:
    a. Vegetated Garden Roof shall be FiberTite Green as supplied by Seaman Corporation
    b. Membrane roof system shall incorporate an EVM Leak Monitoring System as supplied by Seaman Corporation

D. Accessibility

1. It shall be the responsibility of the owner to remove and replace the overburden (garden system and all related components) to expose the membrane roofing system for any and all warranty services.

E. Maintenance

1. Along with the issuance of the warranty, a set of instructions shall be included detailing preventative maintenance requirements on the part of the building owner and noting a list of harmful substances that may damage the FiberTite membrane.

PART 2 | PRODUCTS

2.1 GENERAL

A. All products and components for the FiberTite Green Roofing System shall be supplied by Seaman Corporation.

B. Components other than those manufactured and/or supplied by Seaman Corporation shall be submitted for review, prior to ordering. Any product(s) not specifically authorized in writing for the project by Seaman Corporation, shall be considered unacceptable and their performance excluded from the warranty.

C. FiberTite Green Roofing System may be installed over or directly to pre-approved insulation, cover board or composites thereof. Contact FTCS for additional information regarding compatible substrates.

2.2 MEMBRANE

A. FiberTite Membrane

FiberTite is a nominal 36mil ketone ethylene ester (KEE) membrane, reinforced with a 5.0 oz yd^2 knitted polyester fabric as manufactured by Seaman Corporation, under the trade name FiberTite, conforming to the physical properties as outlined in the associated data sheet. FiberTite exceeds all requirements outlined in ASTM D 6754–02 Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing.

B. FiberTite XT Membrane

FiberTite XT is a nominal 50mil ketone ethylene ester (KEE) membrane, reinforced with a 6.5 oz yd^2 knitted polyester fabric as manufactured by Seaman Corporation, under the trade name FiberTite XT, conforming to the physical properties as outlined in the associated data sheet. FiberTite XT greatly exceeds all requirements outlined ASTM D 6754-02 Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing.

C. FiberTite SM Membrane

FiberTite SM is a nominal 45mil ketone ethylene ester (KEE) membrane, reinforced with a 5 oz yd^2 knitted polyester fabric as manufactured by Seaman Corporation, under the trade name FiberTite SM, conforming to the physical properties as outlined in the associated data sheet. FiberTite SM exceeds the physical property requirements and the surface compound meets polymer content definitions as outlined in ASTM D 6754-02 Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing.

D. FiberTite XTreme Membrane

FiberTite XTreme is a nominal 90mil ketone ethylene ester (KEE), reinforced with a 12.5 oz yd^2 woven polyester mat, as manufactured by Seaman Corporation, under the trade name FiberTite XTreme, conforming to the physical properties as outlined in the associated data sheet. FiberTite XTreme greatly exceeds the physical property requirements and the surface compound meets polymer content definitions as outlined in ASTM D 675-02 Standard Specification for Ketone Ethylene Ester (KEE) Sheet Membranes.

E. FiberTite FB Membrane

FiberTite, FiberTite XT and FiberTite SM are all available in fleece back versions for adhered roofing. FiberTite FB membranes have a heat-bonded 4 oz polyester backing, as manufactured by Seaman Corporation, under the trade name FiberTite FB, conforming to the physical properties as outlined in the associated data sheet(s). FiberTite FB exceeds the physical property requirements and definitions as outlined in ASTM D7654-10 Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing per the individual sub-assembly/base membrane listed above.

F. Flashing Membrane

Nominal 36mil FiberTite, 45mil FiberTite SM, 50mil FiberTite XT shall be used for all respective roofing system flashing requirements to match the field membrane and warranty expectations selected for the roofing system.

G. Acceptable Substrate(s)

1. Authorized rigid insulation or cover board.
2. Structural concrete, insulated or non-insulated.*
3. Insulated steel decking
4. Cellular, lightweight insulating concrete

2.3 RELATED MATERIALS BY SEAMAN CORPORATION

The following product(s) and material(s) shall be supplied by Seaman Corporation:

A. FTR Adhesives

Adhesives, supplied by Seaman Corporation have been specially formulated for FiberTite Membrane Roofing System. *NOTE: Solvent-borne adhesives are not compatible with polystyrene insulation.* Application technique and coverage rates will vary according to substrate and environmental conditions.

1. FTR 190e Bonding Adhesive
   A VOC-compliant, solvent-borne, contact (two-sided) bonding adhesive, designed for bonding non-fleece back FiberTite membranes to properly prepared and pre-authorized horizontal and vertical substrates.
2. FTR 290 Adhesive
   A VOC-compliant, solvent-borne adhesive, one-side application (substrate only), designed for bonding FiberTite FB (fleece back) membranes to properly prepared and pre-authorized substrates.
3. FTR 390 Adhesive

   A VOC-compliant, rubberized/asphalt, water-borne, for one-sided application (substrate only), designed for bonding FiberTite FB (fleece back) membranes to properly prepared and pre-authorized horizontal substrates.
4. FTR 490 Adhesive
   A polymeric water-borne, VOC-compliant adhesive, one-side application (substrate only), designed for bonding FiberTite FB (fleece back) and FiberTite SM to properly prepared and pre-authorized horizontal substrates.
5. FTR #201 Mastic
   A trowel-grade, elastomeric adhesive/sealant used to adhere FiberTite flashing membranes to pre-approved vertical substrates.

B. FTR Fasteners

1. FiberTite Magnum Series to secure FiberTite Membranes to steel, wood and structural concrete decks. A #15-13, buttress threaded, #3 Phillips head fastener

constructed of case-hardened carbon steel with a reduced diameter drill point and corrosion resistant coating.

2. FiberTite HD: To secure insulation to steel, wood and structural concrete decks. A #14-13, heavy-duty threaded steel #3 Phillips truss, self-tapping, corrosion resistant fastener.

C. FTR Stress Plates

1. FTR Magnum Series Barbed Stress Plates – used to anchor FiberTite membranes:
   - **a.** FTR Magnum Plus: 1.5" x 2.75" barbed rectangular stress plate with radial corners; manufactured from 18-gauge AZ-50 galvalume steel.
   - **b.** FTR Magnum R275: 2.75" barbed round stress plate; manufactured from 20-gauge galvanized steel.
   - **c.** FTR Magnum 2S: 2.375" barbed round stress plate; manufactured from 20-gauge galvanized steel.
2. FTR 3" Metal Round Insulation Stress Plates

D. Vegetated System Components

1. FiberTite Green Multilayer System
   - **a.** Protection layer (when required) shall be a minimum 12 oz/yd^2 needle-punched polyester geotextile.
   - **b.** A 0.375" drainage layer composed of extruded polyester woven into an entangled cuspate geometric patterned matrix with heat-welded junctions forming a resilient structure specifically designed to promote proper drainage and ventilation of growing media.
   - **c.** Non-woven polypropylene filter layer attached to drainage layer.
   - **d.** A 0.5" water retention layer shall be a high-loft, non-woven geotextile consisting of durable thermal-bonded polyester fibers treated with insoluble polymer resins to form an evenly distributed, three-dimensional blanket matrix specifically intended for water retention, drainage and anchorage points for promoting solid root structures for plants.
   - **e.** A 0.125" mill-finished aluminum metal edge and trim to frame and connect walkway systems, material changes, and adjacent building components.
2. FiberTite Green Tray System
   - **a.** Protection layer (when required) shall be a minimum 12 oz/yd^2 needle-punched polyester geotextile.
   - **b.** Trays: 2' square x 4.625" deep interlocking trays
   - **c.** Injection molded, 100mil polypropylene
   - **d.** Plastic tray pins

e. Hook and plastic tray pins for drip irrigation system

f. Metal Edger: 26-gauge stainless steel or 18-gauge mill-finished aluminum metal trays and walkways to frame, connect and tie tray and walkway systems into each other and adjacent building components.

g. Irrigation System

3. Growing Media

   a. Growing media; based on German FLL Greenroof Guidelines

   b. Produced from organic recycled material and inorganic by-products for use as a lightweight growing media for hardy, long-lasting succulent or phytoremediation plants that are beneficial in a green roof environment.

   c. Pre-blended regionally and delivered to site for application in:

      i. Bulk: 1.5 yd^3 or 2 yd^3 totes

      ii. Bulk: 1.5 ft^3 bags

4. Plants

   a. Mix of firewise/firesafe, hardy, long-lasting fibrous succulents, capable of thriving in a limited irrigated rooftop environment for project location.

   b. Selections conforming to USDA hardiness zone classification and regional horticulturists recommendation and as accepted by designer.

   c. Plants/Planting Method

      i. Sedum Tiles (pre-planted)

      ii. Sedum Mats (pre-planted)

      iii. Plugs (minimum 1.5” wide plugs)

      iv. Unrooted cuttings (sedum cuttings)

E. EVM Leak Detection

1. ConDuct Stainless Steel Mesh: Open Net, 304 Stainless, 0.75” nominal mesh opening

2. Boundary Cable: conductive loop that forms the test area and is attached to and powered by the impulse generator. The cable can be manufactured from several conductive materials.

F. Additional Components

1. FTR Protection Layer: 12 oz/yd^3 needle-punched polyester geotextile separation sheet.

2. FTR 101 Sealant: A single component, gun-grade polyether sealant to seal flashing termination.

3. FiberClad® Metal: To fabricate metal flashing, 4’ x 10’ sheets of 24-gauge, hot-dipped G-90 steel, or 0.040 thick 3003H14 aluminum, laminated with a 0.020mil polymeric coating.
4. FTR Pre-Molded Flashing(s): Injection-molded, vent stack, split WrapidFlash® and inside/outside corner flashing using FiberTite vinyl compound.
5. FTR Non-Reinforced Membrane: Field fabrication membrane, 0.060mil non-reinforced vinyl membrane.
6. FTR Tuff Track Walkway and Protection Pads: High-grade walkway/protection material with slip-resistant design.
7. FTR Termination Bar: Membrane flashing(s) restraint/termination seals, nominal 0.125” x 1” x 10’ 6060-T5 extruded aluminum bar with pre-punched slots, 8” on center.
8. FiberTite Metal Fascia System: Two-piece snap-on pre-formed, architectural Kynar® metal edge systems.
9. FTR Value Insulation: Polyisocyanurate and extruded polystyrene flat or tapered insulation.
10. FTR 601: Dual-component, single-bead (ribbon-applied), urethane insulation adhesive. Adhesive is a non-solvent, elastomeric, urethane adhesive, specifically designed for bonding single or multiple layers of roof insulation and insulation composites and/or cover boards to structural roof decks and base sheets.
11. FTR T-Joint Covers: Pre-cut 4” x 4” 60mil, non-reinforced membrane to reinforce areas where three overlapping sheets of membrane intersect.
12. FTR Cover Board: Gypsum or gypsum/cellulose core board.

2.4 RELATED MATERIALS

A. Wood Nailers

1. Wood nailers are being tested to determine the effect preservatives on metal components. Borate-treated lumber seems to be less corrosive and is strongly recommended. Installation of other types of treated lumber should be verified with a design professional.
2. Wood shall be No. 2 (or better) construction grade lumber.
3. Creosote or asphaltic type preservatives are not acceptable.
4. Minimum top-nailer thickness shall be 1.5” nominal.

B. Vapor Retarder

1. The decision regarding the inclusion of a vapor retarder within the roof system shall fall within the responsibility of the design professional. Consult National Roofing Contractors Association or other technical resource for appropriate guidelines.
2. Vapor retarder for use in a roof system shall comply with identifiable code and/or insurance requirements.

3. The vapor retarder manufacturer shall certify, in writing, that the specified vapor retarder meets identifiable code requirements and is approved for its intended use.

C. Insulation

1. Insulation shall be installed, where specified and/or required to provide a suitable surface for the FiberTite Membrane Roofing System and/or meet desired thermal values
2. Acceptable products must be pre-approved in writing by Seaman Corporation and comply with the minimal characteristics and classification listed for the products below:
   - **a.** Approved Products
     - **i.** FTR Value Polyisocyanurate
       - Factory Mutual Approved rigid insulation meeting Class A 1-90, for fire and wind.
       - UL Classification: Class A.
       - Density: 2 lb/ft^3 minimum
       - Meet requirements of ASTM C1289
     - **ii.** FTR Value XPS
       - Factory Mutual Approved rigid insulation meeting Class A 1-90, for fire and wind.
       - UL Classification: Class A.
       - Density: 1.5 lb/ft^3 minimum
       - Meet requirements of ASTM D1621
     - **iii.** Gypsum Core Cover Board
       - Factory Mutual Approved meeting Class A 1-90, for fire and wind.
       - UL Classification: Class A Assembly.
       - Meet requirements of ASTM C 473
       - Georgia-Pacific DensDeck® Prime or United States Gypsum Securock®

D. Adhesives for Insulation Attachment

1. General
   - **a.** Adhesive not specifically supplied by Seaman Corporation shall be listed and approved by Factory Mutual Research in conjunction with the specified insulation and specific substrate.
   - **b.** Adhesive shall meet minimum roofing system design requirements as evidenced by testing in conjunction with the proposed substrate and or composite; under FM-Global requirements or acceptable third party laboratory.
   - **c.** Adhesive manufacturer shall provide written specifications regarding the safe handling, storage, and surface preparation for a quality application of the product.
   - **d.** All adhesives shall be pre-authorized by Seaman Corporation.
2. Polyurethane

a. Adhesive shall be either a dual or single component polyurethane adhesive, dispensed from a portable pressurized container or traditional foam equipment.

b. Pre-Approved Products

i. FTR 601

ii. FTR CR-20

3. Hot Asphalt

a. Asphalt shall be Type III or Type IV steep asphalt, according to ASTM D-312.

b. Asphalt shall be applied within 25O°F of the asphalt manufacturer's recommended Equiviscous Temperature (EVT). If the manufacturer does not supply the EVT Seaman Corporation recommends a temperature range of 425°F for mopping and 450°F for mechanical spreaders. Asphalt applied within 25°F of the EVT, under normal environmental conditions; will provide a nominal 23-25 lbs/100 ft^3 of asphalt.

c. The roofing contractor is responsible for maintaining the temperature tolerances at the kettle as well as the rooftop at all times.

d. Cold weather application can cause significant drops in the temperature of the asphalt during transport to the roof and points of application. Insulated equipment is recommended during cold weather applications.

e. All projects utilizing hot asphalt for insulation securement require written authorization, prior to the bidding process, by Seaman Corporation.

E. Hardscape

1. Concrete Pavers: minimum 2' x 2' x 2" freeze/thaw resistant, pre-cast, concrete paver blocks for pathways and retention of growing medium

2. Stone Ballast: nominal 2.5" diameter #2 river-washed, stone conforming to ASTM D448. Used for membrane ballast and or drainage

3. Pre-cast stone, wood timbers and other landscape items as necessary and/or appropriate to create transitions between the rooftop garden and other roof areas

PART 3 | EXECUTION

3.1 GENERAL

A. The authorized roofing contractor shall ensure strict compliance with FTR GRS02/13 General Guide Specifications for Installation of FiberTite Roofing Systems.

B. The roofing contractor shall provide a suitable substrate surface for the proper installation of the FiberTite Green Roofing System, roof insulation and specified components.

C. Application of Seaman Corporation/FiberTite materials constitutes an agreement that the roofing contractor has inspected and found the substrate suitable for the installation of the FiberTite Green Roofing System.

D. The roofing contractor shall coordinate the installation to ensure that the system remains watertight at the end of each working day

3.2 SUBSTRATE PREPARATION

A. The roofing contractor shall verify that the deck condition and/or existing roof construction is suitable for the specified installation of the FiberTite Green Roofing System.

B. Seaman Corporation requires fastener withdrawal values (pull-out tests) on all reroofing projects to verify the suitability of decking to accept a mechanically fastened insulation and/or membrane roof system.

C. Examine surfaces for inadequate anchorage, low areas that will not drain properly, foreign material, ice, wet insulation, unevenness or any other defect that would prevent the proper execution and quality application of the FiberTite Membrane Roofing System as specified.

D. Prepared substrate shall be smooth, dry, and free of debris and/or any other irregularities that would interfere with the proper installation of the FiberTite Green Roofing System.

E. The application of adhesives or hot asphalt directly to structural concrete, gypsum, Tectum™, lightweight insulating concrete, existing smooth and/or granulated BUR materials may require sealing or priming with an appropriate elastomeric or asphalt primer prior to application.

F. Adhesives will not bond to wet, damp or inadequately cured lightweight insulating concrete or poured structural concrete.

G. Do not proceed with any part of the application until all defects and preparation work have been corrected and complete.

3.3 SUBSTRATE PREPARATION (NEW CONSTRUCTION)

A. Confirm substrate suitability as specified and required in FTR GS02-13 Section 3.3

3.4 SUBSTRATE PREPARATION (REROOFING)

A. Confirm substrate suitability as specified and required in FTR GS02-13 Section 3.4

3.5 WOOD NAILERS

A. Install treated lumber at the same heights as insulation layer or adjacent construction ± 0.25”. Continuous treated wood nailers are to be installed at all perimeters, around roof projections and penetrations as shown in approved details.

B. Where wood nailers are installed directly on the substrate, the substrate shall be carefully examined to confirm that the entire area provides a suitable fastening surface. All defects shall be repaired by the appropriate trade prior to installation.

C. Nailers shall be at least 3.5" wide and 1.5" high and installed and anchored in such a manner to resist a force of 250 lbs/linear foot of wood blocking in any direction.

D. Nailers along parapets, curbs and expansion joints are recommended for insulated decking. Consult FiberTite Construction Details or FiberTite Technical Customer Services for optional/alternate membrane termination/securement methods.

3.6 ROOF INSULATION

A. General

1. Install roof insulation according to and in complete conformance with project specifications.
2. Roof insulation shall be installed where by the long dimension of the board(s) run in parallel alignment and the short dimensions are staggered.
3. Insulation shall be installed with minimum joint dimensions and shall be tightly butted where possible. Maximum joint widths shall be 0.375". Damaged corners shall be cut out and replaced with an insulation piece a minimum of 12" x 12". Pieces that are cut from larger panels and are smaller than one square foot are not acceptable.
4. Install no more than can be covered during the same working day.
5. Taper roof insulation to drain sumps using tapered edge strips. If an insulation layer is 1.5" or less, taper 12" from the drain bowl. If insulation thickness exceeds 1.5", taper 18" from the drain bowl. All taper boards or pieces must be adhered or mechanically fastened with a minimum of two fasteners per board.
6. At the end of each working day, provide a watertight cover on all unused insulation as to avoid moisture penetration and/or damage.

3.7 Electronic Vector Mapping (EVM) LEAK DETECTION (AS REQUIRED FOR SINGLE SOURCE VEGETATED ROOF SYSTEM WARRANTY)

A. General

1. The ConDuct grounding screen is used to provide grounding for manual electronic leak detection tests.
2. The grounding screen shall be installed over the roof insulation and or directly below the approved cover board for FiberTite Green Vegetated Roof Systems utilizing adhered roofing membranes.
3. For mechanically fastened membranes utilizing FiberTite Green Vegetated Roofing Systems the grounding screen may be installed directly over the coverboard prior to mechanically fastening the membrane.
4. Unroll grounding screen over substrate.

5. Overlap adjacent runs of grounding screen a minimum of 3". Positive contact between adjacent runs of screen is required at both side and end laps.
6. Tape adjacent layers together using duct tape or aluminum tape spaced between 5′ and 10′ to prevent shifting.
7. Connect the grounding screen to conductive part of the structure (i.e. metal deck, metal curb, metal vent stack or metal drain body) at several separate locations.
8. **Do not ground the screen mesh to lightening protection.**

3.8 COVER BOARD INSTALLATION

A. General

1. For mechanically fastened membranes, loose lay the coverboard directly over the insulation and then mechanically fasten the coverboard through the mesh per preliminary securement requirements for the coverboard.
2. For adhered cover board installation over a grounding screen, install FTR 601 Insulation Adhesive directly over loose laid grounding mesh. Space adhesive ribbons according to project specifications and/or as required for specified uplift resistance.
3. Place the cover board directly over the screen/ribbons of adhesive and walk-in to assure good contact. The insulation adhesive will bond the cover board to the insulation through the grounding mesh.

3.9 INSTALLATION OF FIBERTITE MEMBRANE(S)

A. Quality Control

1. It is the responsibility of the roofing contractor to initiate and maintain a quality control program to govern all aspects of the installation of the FiberTite Membrane Roofing System.
2. The project foreman and or supervisor will be responsible for the daily execution of the QC program, which will include, but is not limited to, the supervision, inspection and probing of all heat welded seams incorporated within the FiberTite Membrane Roofing System.
3. If inconsistencies in the quality of the application of the composite, membrane and/or welds are found, all work shall cease until corrective actions are taken to ensure the continuity the installation.

B. General

1. Work shall be coordinated to ensure that sequencing of the installation promotes a 100% watertight installation at the end of each day.
2. All FiberTite Membrane Roofing System shall be designed utilizing and determined to be in compliance with the procedures outlined within the current publication of ASCE Standard 7. Alternative designs may be determined using the criteria within Factory Mutual Research Loss Prevention Data.

3. A FiberTite Membrane Roofing System may utilize either conventional roll goods or custom pre-welded panel rolls or a combination of both.
4. Restrictions regarding outside ambient air temperature are relative only to the exposure limits of the workers and/or adhesives when necessary.
5. When using adhesives outside ambient air temperature shall be above 40°F. Curing or drying time of the adhesive will be affected by ambient temperatures and must be taken into consideration when determining flashing lengths.
6. Humidity can affect the drying time of solvent borne adhesives and/or cause condensation to form on the newly applied adhesive.
7. No moisture may be present on the adhesive(s) prior to mating or application of FiberTite membranes.
8. FiberTite Membrane Roofing System shall only be installed over properly prepared and sound substrates, free from excessive surface roughness, dirt, debris and moisture.

C. Membrane Installation

1. Refer to and follow Seaman Corporation Guide Specifications as referenced in Sec. 1.2 for the Installation of FiberTite Roofing Systems and/or specific membrane system application method(s) as dictated by project specifications.

D. T-Joint Cover Installation

1. Installation of T-Joint Covers is mandatory on all FiberTite Green Vegetated Roof Systems.
2. Install T-Joint Covers, centered and aligned so edges are parallel to roof system seams.
3. The T-Joint Cover shall be 100% welded.

E. Welding

1. General
    a. All field seams exceeding 10’ in length shall be welded with an approved automatic welder.
    b. All field seams must be clean and dry prior to initiating any field welding.
    c. Remove foreign materials from the seams (dirt, oils, etc.) with acetone or authorized alternative.
    d. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
    e. Contaminated areas within a membrane seam will inhibit proper welding and will require a membrane patch.
    f. All membrane T-Joints Covers shall receive a minimum 3” x 3” cover.

g. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.

2. Hot Air Hand Welding

   a. The lap or seam area of the membrane may be intermittently tack welded to hold the membrane in place.

   b. The back interior edge of the membrane shall be welded first with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.

   c. The nozzle of the hand held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be use to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1.5" wide nozzle, to create a homogeneous weld, a minimum of 1.5" in width.

   d. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1" weld.

3. Automatic Hot Air Machine Welding

   a. Proper welding of the FiberTite Membrane can be achieved with a variety of automatic welding equipment. Contact FTCS for specific recommendations.

   b. Follow all manufacturers' instructions for the safe operation of the automatic welder.

   c. Follow local code requirements for electric supply, grounding and surge protection.

   d. The use of a dedicated, portable generator is highly recommended to ensure a consistent electrical supply, without fluctuations that can interfere with weld consistency.

   e. Properly welded seams shall utilize a 1.5" wide nozzle, to create a homogeneous weld, a minimum of 1.5" in width.

F. Membrane System Inspection

1. The job foreman and/or supervisor shall initiate daily inspections of all completed work, which shall include, but is not limited to the probing of all field welding with a dull pointed instrument to assure the quality of the application and ensure that any equipment or operator deficiencies are immediately resolved.

2. Ensure that all aspects of the installation (sheet layout, attachment, welding, flashing details, etc.) are in strict accordance with the most current FiberTite Membrane Roofing System Specifications and Details.

3. Excessive patching of field seams because of inexperienced or poor workmanship will not be accepted at time of **final inspection for warranty acceptance.**
4. Any deviation from pre-approved specifications and/or details requires written authorization from the FTCS prior to application to avoid any warranty disqualification.
5. It is the contractor, job foreman, and supervisor and/or quality control personnel to perform a final self-inspection on all seams prior to requesting the inspection for warranty issuance by the FTCS.

3.10 FLASHING

A. Clean all vents, pipes, conduits, tubes, walls and stacks to bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipes and drain flashing. Flash all penetrations according to approved details.

B. Remove all loose and/or deteriorated cant strips and flashing.

C. Flash all curbs, parapets and interior walls in strict accordance with approved FiberTite details.

D. All flashing shall be adhered to properly prepared, approved substrate(s) with FTR 190e, FTR 490 Adhesive or FTR 201 mastic applied in sufficient quantity to ensure total adhesion.

E. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the wood nailers to a maximum width of 8".

F. Vertical flashing shall be terminated no less than 8" above the plane of the deck with approved termination bar and counter-flashing or metal cap flashing.

G. When using FTR 201 as the adhesive, vertical wall flashing termination shall not exceed 40" without supplemental mechanical attachment of the flashing between the deck and the termination point of the flashing.

H. Complete all inside and outside corner flashing details with FiberTite pre-formed corners or an approved field fabrication detail.

I. Probe all seams with a dull, pointed probe to ensure the weld has created a homogeneous bond.

J. Install penetration accessories in strict accordance with approved details. Ensure penetration accessories have not impeded in any way the working specification. Refer to the related trade for the technical specification.

3.11 METAL FLASHING

A. All perimeter edge details are to be fabricated from FiberClad metal or utilize a prefabricated FiberTite fascia system.

B. Ensure all fascias extend a minimum of 2” lower than the bottom of the wood nailers.

C. Fasten all metal flashing to wood nailers or approved substrate with approved fasteners 8” on center.

D. Break and install FiberClad metal in accordance with approved details, ensuring proper attachment, maintaining 0.5” expansion joints and the installation of a minimum 2” bond breaker tape prior to sealing the joint.

E. Solidly weld FiberClad expansion joints with a 6” strip of FiberTite membrane welded to the FiberClad, covering the bond breaker tape (cover plates are optional).

F. Roof Drains

1. Flash all roof drains in accordance with FiberTite roof drain details.
2. Replace all worn or broken parts that may cut the FiberTite membrane or prevent a watertight seal. This includes the clamping ring and strainer basket.
3. Replace all drain bolts or clamps used to hold the drain compression ring to the drain bowl.
4. FiberTite non-reinforced 60mil membrane shall be used for flashing the drain assembly. Drain assemblies and basins, or sumps must be free of any asphalt or coal tar pitch residue prior to installation.
5. The drain target sheet should be sized and installed to provide for a minimum of 12” of exposed 60mil on all sides of the drain.

G. Pitch Pans

1. Every reasonable effort shall be made to eliminate the need for pitch pans including the removal of all existing pans. Contact FTCS for specific design alternatives and recommendations.
2. In the event of no alternative, fabricate pitch pans from FiberClad metal, installed in accordance with FiberTite details, ensuring proper attachment, maintaining a minimum of 2” clearance around the penetration.
3. Pitch pans shall be filled with non-shrinking grout to within 1” of the top of the pan. Allow the grout to dry and fill remainder of the pan with FTR SL1 pourable sealant.
4. Pitch pans and the sealant will require periodic maintenance by the building owner’s maintenance personnel.

3.12 EXPANSION JOINTS

A. Flash all expansion joints in accordance with authorized details. Fasten all expansion joint material according to FiberTite specifications. Ensure the expansion material has sufficient material to expand to the widest point in expansion without causing undue stress on the expansion joint material.

B. If the expansion joint is a pre-formed system, the manufacturer, description, and a drawing illustrating the method of installation must be included when the (FTR PIN) is submitted.

3.13 SEALANTS

A. Apply authorized sealant(s) to all surface mounted reglets and per project requirements. Sealant(s) are to shed water. Follow all manufacturer instructions and installation guides.

B. Use primer when recommended by the manufacturer.

C. Sealants will require periodic maintenance by the building owner's maintenance personnel.

3.14 TEMPORARY SEALS

A. At the end of each working day or at the sign of rain, install temporary, 100% watertight seal(s) where the completed new roofing adjoins the uncovered deck or existing roof surface.

B. The authorized roofing contractor shall create and maintain the temporary seal in such a manner to prevent water from traveling beneath the new and/or existing roof system.

C. The use of plastic roofing cement is permissible when sealing to an existing built up roof.

D. If water is allowed to enter beneath the newly completed roofing, the affected area(s) shall be removed and replaced at no additional expense to the building owner.

E. Prior to the commencement of work, cut out and remove all contaminated membrane, insulation, roof cement or sealant and properly dispose off site.

3.15 QUALITY ASSURANCE TESTING

A. Prior to the installation of the vegetation roof system components, an interim inspection for warranty acceptance of the membrane system shall be coordinated with FTCS.

1. Upon completion of the FiberTite Membrane System, the authorized roofing contractor shall complete and submit the FiberTite Project Completion Notice to FTCS.
2. Upon receipt of the notice of completion, a FTCS representative will schedule an inspection with a representative of the authorized roofing contractor to thoroughly review the installation and verify compliance with Seaman Corporation specifications and authorize the continuation of Quality Assurance Testing by either a water test or EVM testing per project requirements.
3. Do not proceed with the installation of the vegetated garden roof components until all Quality Assurance Testing has been completed and the membrane roof system accepted by Seaman Corporation.

B. Water tests are required on ALL projects requiring a standard FiberTite Commercial Roofing Warranty. FTCS must be present at all water tests.

1. Plug all drains and flood the associated area to a minimum depth of 2". Let water stand for 24 hours.
2. Remove all water from the test area and thoroughly inspect all the area for leaks or signs of water entry below the membrane roofing system. This shall include both and above and below the surface examination.
3. The contractor shall be prepared to provide test cuts and the associated repairs if and when FTCS and/or the owner's representative request them.
4. Any areas found to be wet or areas of water entry shall be opened, dried, repaired to Seaman Corporation standards, and retested as described in this section.

C. EVM Testing is required for ALL FiberTite Green Single Source Warranties.

1. Coordinate FiberTite Smartex electronic leak detection before installing the vegetated overburden and associated components.
2. Ensure a roofing contractor representative is present and available to make immediate repairs in the event a breach in the membrane roof system is detected.
3. Install the boundary cable directly on the FiberTite membrane 4" to 6" from the perimeter of the roof areas to be tested. The EVM Technician will determine the size and shape of the areas.
4. Secure the boundary cable with duct tape to prevent movement or damage to the cable and so as not to create a tripping hazard.
5. Wet the entire roofing membrane test are with water prior to the start of each test and maintain the wet condition for the duration of the testing. Ponding water is not necessary.
6. Allow the testing technician to inspect the roof area. If a breach is detected the technician will report to the roofing contractor immediately.
7. Defects found shall be immediately repaired by the roofing contractor and retested by the technician.
8. The technician shall provide a test report documenting the initial status of the roofing membrane, testing procedures, daily activity and a schematic drawing indicating the location of defects and the stationary boundary cable.
9. Restrict construction traffic on the newly tested and accepted membrane system to only that which may be required to install the vegetated overburden components.

3.16 PROTECTION LAYER

A. Inspect and verify that roofing membrane and components are complete and ready prior to installing the protection layer.

B. Sweep the roof area with a broom and then blow remaining dust and debris from the membrane area to receive FiberTite Green Vegetated Roofing System components.

C. The contractor shall loose lay the membrane protection layer over the finished membrane roofing system

D. All seams in the protection layer must be shingled and overlapped a minimum of 4".

3.17 INSTALLATION OF VEGETATED GARDEN ROOF COMPONENTS

A. The contractor shall limit traffic over the completed membrane roofing system.

B. The contractor shall protect the completed membrane roofing system during the transport of rooftop garden components and growth medium.

C. Install vegetated rooftop garden components in proper sequence and methodology as specified.

D. FiberTite Green Multi-Layer System

1. Place multilayer system directly over protection layer (if required).
2. Place drainage layer with attached filter layer parallel to roof slope.
    a. Butt seams and overlap with provided filter layer extension.
3. Place retention layer over the drainage/filter layer composite perpendicular to roof slope.
4. Promptly after placing multilayer on the roof, install growth media or ballast as necessary to prevent movement of multilayer due to weather and construction activities.

E. FiberTite Green Tray System

1. Place trays directly over protection layer.
2. Position bottom troughs of trays perpendicular to roof slope, except at minor crickets.
3. Orient and overlap edges to interlock and hold trays in place.
4. Attach trays in place with standard plastic tray pin through the aligned holes in tray sidewalls
5. Secure trays together with plastic tray pin fasteners and install metal edger in place.
6. If integral irrigation is being used, place hooks concurrently with trap pin in parallel direction of drip tube.
7. Promptly after placing trays on roof, install growth medium or ballast as necessary to prevent movement of trays due to weather or construction activities.
8. Irrigation System Placement
    a. Layout and secure irrigation lines to trays using irrigation hook and plastic tray pin fastener system
    b. Install poly-header at tray perimeter.
    c. Connect drip tube to poly-header with supplied barb fittings

d. Connect poly-header to water supply, including sub-mains, valves, and backflow prevention systems.

F. Metal Edge

1. For multilayer system
   a. Follow FiberTite Green Details for installation of metal trim.
   b. Install trim flashing to conceal multilayer sides and/or to lock into metal counter flashing at building perimeter flashing systems as specified.
   c. Install interlocking metal anchor flashing at openings between multilayer and perimeter roof edges to anchor multilayer, building perimeter flashing and counter flashing together.
2. Tray System
   a. Follow FiberTite Green details for interconnection of metal edge system.
   b. Install metal edge to conceal tray sides.
   c. When using integrated irrigation system; place irrigation polyheader within irrigation edger.
   d. Install interlocking metal edger at openings between trays and perimeter roof edges to anchor drays, building perimeter flashing and counter flashing together.

G. Growing Media

1. Transport bulk growing media to roof using stabilized hoisting equipment, blower truck or cranes.
2. Remove any and all debris within trays or on top of multilayer composite.
3. Distribute growing media evenly throughout tray system or across multilayer system.
4. Maintain a consistent finish grade.
5. Place media at required depth according to project specifications.

H. Planting

1. Install planting (plugs, tiles, mats, unrooted cuttings) conforming to landscape design and other requirements as specified.
2. Distribute differing plant species evenly for overall uniform appearance of overall installation.
3. Following installation of plant media, irrigate using potable water that is free of substances harmful to plant growth. Provide hoses in lengths reaching from water supply source to all plant material.

3.18 WALKWAYS

A. FiberTite walkways and protection pads shall be installed at staging areas for roof top equipment maintenance or areas subject to regular foot traffic.

1. Walkway Installation
    - **a.** Roofing membrane to receive walkway material shall be clean and dry.
    - **b.** Cut and position the FiberTite walkway material as directed by the specifications or agreement.
    - **c.** Hot air weld the entire perimeter of the walk way to the previously cleaned FiberTite roofing membrane. Avoid excessive heating of the walk way material to prevent scorching the underlying roofing membrane.
2. Hardscape Installation
    - **a.** Install Hardscape (ballast/pavers etc) walkways and borders according to project drawings and FiberTite Green details.
3. Protection Pad Installation
    - **a.** Roofing membrane to receive protection pad material shall be clean and dry.
    - **b.** Prior to installing the FiberTite protection pads (0.25" x 2' x 4'), weld a 6" x 6" strip of FiberTite membrane to each of the four corners of the back side of the pad. Position the strips in such a way that they overhang the edge of the pad a minimum of 2" around the 90° corner.
    - **c.** Position the FiberTite protection pads as directed by the specifications or agreement and weld the visible portion of the previously applied stripping to the FiberTite roofing membrane.

3.19 LIGHTNING PROTECTION

A. The installation of lightning protection must be coordinated with the authorized FiberTite roofing contractor, certified lightning contractor and the building owner.

B. The lightning protection must be installed in such a manner that base plates, air terminals, and cables do not penetrate the roofing membrane without the use of pre-approved flashing details.

C. Cables and air terminals may be attached to the membrane using base plates and an approved construction adhesive or by welding intermittent strips of FiberTite membrane over the base plates and cables to the FiberTite roofing. Contact FTCS for specific adhesive recommendations.

D. Recommendations regarding the selection of adhesives or alternative affixing of lightning protection systems to the FiberTite membrane does not, in any way, imply a warranty covering their performance or ability of the adhesives to remain affixed to the FiberTite membrane.

3.20 COMPLETION

A. Remove all debris, excess materials, and scrap from the roof and surrounding premises prior to demobilization.

B. Inspect all field welds, detailing and terminations to ensure a 100% watertight installation.

3.21 FINAL INSPECTION FOR WARRANTY

A. Coordinate the final inspection of the completed FiberTite Green Vegetated Roof System with owner, architect, contractor and FTCS.

B. Make adjustments and alignments of garden roof system components as necessary to give a uniform and finished appearance.

C. Replace plant media that appears to be stressed or damaged.

D. Any corrections or modifications necessary for compliance with the specifications and acceptance for warranty (punch list) will be noted on the Final Inspection for Warranty Form.

E. Upon completion of all punch list items and final acceptance of the installation, a warranty as authorized by the approved Seaman Corporation/FiberTite Pre-Installation Notice will be issued.

3.22 VEGETATED GARDEN ROOF MAINTENANCE

A. Maintain a uniform stand of succulent plants by watering and maintain vegetated system for a minimum period of 90 days following installation and through substantial completion and occupancy by owner.

1. Include watering, spot weeding, fertilization and other measures as necessary to maintain health and propagation of plant materials and as necessary for stabilization.
2. Instruct owner and furnish written maintenance instructions, following maintenance period, as necessary for planting materials to develop complete root structure and to become stabilized.
3. Provide periodic hydration as needed, depending on precipitation.
4. Follow horticultural/nursery recommended plant maintenance procedures.

B. Annual Maintenance Agreement

1. Following initial construction maintenance, consult with owner to negotiate for the continuance of the maintenance of vegetated garden system as offered by contractor.
    - **a.** Include watering for first year after installation to ensure proper root development.
    - **b.** Continued watering should be done on an as needed basis.

END OF SECTION FTG VRS05/13

FiberTite® Seaman Corporation

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