STEVENS ROOFING SYSTEMS
GARDENTOP™ ROOF - EXTENSIVE

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CSI Division 7 Guide Specifications

STEVENS GARDENTOP™ EXTENSIVE ROOF SYSTEM

(SHALLOW TO MEDIUM SOIL)

PART 1 - GENERAL

1.01 Description

A. Furnish and install a Stevens Extensive GardenTop™ Roof System (shallow to medium soil depth, 2.0-in. to 6.0-in.) in accordance with drawings and specifications approved by Stevens Roofing Systems (Stevens).

Special Conditions

1. This specification is applicable for building roofs that have steel or structural concrete deck structures capable of safely supporting the anticipated roof loads, meet the guidelines herein and have no abnormally severe or unknown environmental exposures, except as specifically authorized herein. The Stevens Extensive Garden Roof system should only be applied on structures with a roof slope of 2-in. in 12-in.or less.

2. Applications that involve severe exposures, (ASCE Ground Roughness Category D or buildings operating with positive internal pressure) require review by Stevens Roofing Systems Technical Review Dept. before any specification is valid *(See Table 3)*.

B. Related work: Metal work other than Stevens Edge Metal Systems is not covered by any Stevens warranty. Metal work must be secured in a manner approved by Stevens and/or in accordance with SMACNA guidelines to prevent damage from buckling or wind exposure. All metal work that is part of the waterproofing envelope must be sealed, structurally sound, and appropriately anchored to prevent leakage.

1.02 Quality Assurance

A. Apply roofing system using a roofing contractor authorized by Stevens.

B. Stevens EP™ (TPO) and Stevens EV™ (Elvaloy®) membrane products are classified by Underwriters Laboratories as Class A sheathing materials for use in construction of Class A roofing assemblies. See *UL's Fire Resistance Directory* for specific assemblies. Stevens EP and Stevens EV membrane products bear the Factory Mutual Global (FMG) mark and are approved for use in Class 1A fire and windstorm resistance constructions (Refer to current edition of *FMG Approval Guide*).

C. Substrate Acceptance: For projects requiring labor and material warranty, arrange with membrane manufacturer to have services of field representative at site to accept substrate surface before installation of waterproofing materials.

D. Water Test: For projects requiring labor and material warranty, water test completed waterproofing system for minimum 24 hours. Owner's representative and membrane manufacturer will witness water testing and confirm results in writing.

E. Inspection: Upon completion of the membrane installation, an inspection shall be made by a representative of Stevens to ascertain that the roofing membrane system has been installed according to Stevens-approved specifications and details. Do not place overburden or growing medium on membrane until all inspection punch list items have been completed and approved. Upon final approval of the project, a Warranty shall be written.

F. Lead time for inspections: A two-week lead time is typically required for scheduling in-progress or final inspections. Large projects should have in-progress inspections performed so that the overburden can be installed in stages to secure the membrane.

G. Stevens Authorized Applicator is responsible for monitoring the application of overburden and backfilling operations to prevent damage to the completed waterproofing system.

H. Changes: Should there be deviations or changes from this specification without written approval of Stevens, the project is not autho-

rized for installation and is not eligible for Warranty.

I. Stevens EP (60 mil, 80 mil) and Stevens EV (60 mil) membranes are manufactured in an ISO-9001:2000 facility.

1.03 Submittals

A. Minimum job file submittal information for consideration for labor and material warranty coverage shall be an accurately completed Request for Warranty form (www.stevensRFW.com) and the information discussed in paragraph B, following.

B. Samples and data sheets of all materials not supplied or approved by Stevens shall be submitted to Stevens for written approval prior to the start of installation. Authorized applicators must submit a roof drawing indicating which details will be employed in the project. These drawings shall be approved by Stevens prior to the start of work. These must include: outline and size of the roof, location and type of penetrations, perimeter and penetration flashing detail references, and a copy of any non-SR details to be used. Details which do not conform to Stevens Standard SR Details, must be shown as to their anticipated construction.

C. A structural engineer or owner's representative will verify in writing to Stevens Roofing Systems the structure's ability to safely support the membrane waterproofing system and overburden materials.

D. For a Limited Membrane Material-Only Warranty, the Request for Membrane Warranty form is the only submittal required.

1.04 Delivery and Storage

A. All materials provided by Stevens shall be delivered with appropriate packaging labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions.

B. Materials shall be stored in original undamaged packaging and storage conditions shall be maintained in accordance with manufacturers' requirements.

1.05 Precautions

A. Adhesives, solvents, and caulks as indicated are extremely flammable and/or toxic. Follow precautions indicated on containers or packaging labels.

B. Surfaces to be bonded shall be dry, clean and free of debris. Suitable surfaces are usually considered to be smooth; solid masonry, wood, and metal, plus insulation boards fastened to the specific manufacturer's recommendations for receiving adhered roofing membranes and accepted by Stevens for adhered applications of Stevens membranes.

C. All fasteners are recommended to be installed with a depth-sensing screw gun to prevent overdriving or under driving. The ASAP and PIF adapter tools are recommended for the installation of Stevens ASAP and Stevens PIF Fasteners.

D. Block off or shut down positive pressure building ventilation systems during application to prevent sheet from billowing during application.

E. Consideration should be given in the project design to potential safety problems that can precipitate from the smooth surface characteristic of the Stevens EP or Stevens EV sheet. The membrane surface becomes slippery when wet. If access to roof is required, walkway surfaces are recommended.

F. Job specification and retrofit preparation should always include provision to ensure positive drainage in all areas. Good roofing practice does not permit uncontrolled, uncollected drainage over the edge of a roof.

G. All rooftop mechanical units are to have their condensation lines piped to drains, or off the roof where practical

H. Grease shall not be allowed to accumulate on the roof. If rooftop grease units are not to receive a continual maintenance program they are to have an approved grease containment system specified.

I. At the discretion of Stevens, excessive patching as a result of damage to the Stevens membrane or caused by faulty installation may require total recover in those areas.

J. For buildings with canopies or large wall openings, e.g. hangar doors and truck entrances or docks, which are subject to positive pressurization from wind, or from air handling systems, consult Stevens for suitability of application and possible design enhancement requirements.

K. Shut down rooftop fresh-air intakes and secure ventilation systems that recycle air through open cavities between ceilings and roof deck. Operation of HVAC equipment shall be coordinated with building owner to ensure fresh air intake vents do not operate in the vicinity of the

adhesive application to prevent vapors from entering the building.

L. The roofing system shall be protected as necessary against damage from rooftop traffic and/or the activities of other trades.

1.06 Warranty

A. A Stevens representative shall inspect the installation for compliance with applicable Stevens specifications upon completion when presented for system warranty consideration.

B. Upon acceptance of the roofing systems installation, a Stevens Standard Warranty will be issued for a five (5), ten (10), fifteen (15) or, with prior written approval, twenty (20) year period covering wind damage at up to 60 mph.

C. The cost of removal and/or replacement of the overburden components necessary for the investigation of leaks shall be borne by the Building Owner.

D. See *"General Warranty" Section* on the Stevens Technical Manual CD for more information.

PART 2 - PRODUCTS

2.01 General

A. Stevens-supplied materials shall be used for the construction of the roof. In the event that a component of the roof system is not available from Stevens, alternate materials will be specified herein or approved in writing by Stevens. Samples of all materials to be used on the project that are not supplied by Stevens shall be furnished to the Stevens Technical Review Dept. for written approval prior to the start of work.

2.02 Membrane

A. Membrane for roof cover shall be .060-in. or .080-in. nominal thickness overall, or .060-in. thick membrane with fleece backing, scrim-reinforced, hot-air weldable sheet material supplied to the job site in 76.5-in. wide rolls. Packaging to bear the UL label and exposed face color shall be standard white.

1. **Stevens EP™:** Ethylene Propylene-based sheet roofing manufactured in accordance with ASTM D 6878-03 for TPO-based roofing material and conforming to the minimum physical properties stated in Table 1 *Physical Properties chart*.
2. **Stevens EP-Fleece:** Ethylene Propylene-based sheet roofing with a factory laminated fleece backing, manufactured in accordance with ASTM D 6878-03 and conforming to the minimum physical properties stated in the Product Specification Data Sheet section of the Stevens Technical Manual.
3. **Stevens EV™:** Elvaloy® (KEE)-based sheet roofing manufactured in accordance with ASTM D 4434-96 and conforming to the minimum physical properties stated in Table 2 *Physical Properties Chart*.
4. **Stevens EV-Fleece:** Elvaloy® (KEE)-based sheet roofing with a factory laminated fleece backing, manufactured in accordance with ASTM D 4434-96 and conforming to the minimum physical properties stated in the Product Specification Data Sheet section of the Stevens Technical Manual.

2.03 Related Materials

A. Flashing: Flashing shall be made of the non-fleece Ethylene Propylene or Elvaloy® KEE-based membrane types described in Section 2.02. Unreinforced .055-in.-thick, Ethylene Propylene or Elvaloy® KEE-based membrane shall be supplied for field-fabricated flashings for vent stacks, pipes, drains and corners.

B. Adhesives, Sealants, Primers and Caulks:

1. **Stevens EP Fastline Membrane Adhesive by Ashland:** A one-part, moisture curing urethane adhesive designed specifically for adhering Stevens EP membrane to an approved isocyanurate insulation layer or DensDeck Prime® cover board in horizontal applications. The adhesive is applied directly from its container in 1/2-in. to 3/4-in. wide beads. This adhesive **is not** approved for use with Stevens EP-Fleece products or Stevens EV (Elvaloy®) membranes.
2. **Bonding Adhesive:** Bonding Adhesive is designed for bonding Stevens non-fleece backed membrane to wood, metal, masonry, and approved roof insulation board surfaces.
   a. **Stevens EP (TPO) Bonding Adhesive**: Specifically formulated for Stevens EP membrane and **is not** approved for use with fleece products or Stevens EV (Elvaloy®) membrane.
   b. **Stevens EV (Elvaloy®) Bonding Adhesive**: Specifically formulated for

Stevens EV membrane and **is not** approved for use with fleece products or Stevens EP (TPO) membrane.

3. **Stevens Water-based Fleece Adhesive** is a synthetic polymer-based adhesive that is designed for bonding Stevens EP-Fleece or Stevens EV-Fleece membranes to an insulation layer, cover board or cellular lightweight concrete. This adhesive **is not** approved for use with non-fleece membranes.
4. **Stevens All-Purpose Sealant:** Stevens All-Purpose Sealant is designed to be used as a water cutoff mastic, sealant to top off pitch boxes, and an exterior grade caulk for metal work. Approved for use with both Stevens EP and Stevens EV membrane systems.
5. **Cut-Edge Sealant:** Cut-Edge Sealant is a solvent-based caulk developed to seal exposed cut edges of reinforced membrane.
   a. **Stevens EP (TPO) Cut-Edge Sealant**: Specifically formulated for Stevens EP membrane and **is not** approved for use with Stevens EV (Elvaloy®) membrane.
   b. **Stevens EV (Elvaloy®) Cut-Edge Sealant**: Specifically formulated for Stevens EV membrane and **is not** approved for use with Stevens EP (TPO) membrane.
6. **Seam Cleaner:** Used as a surface cleaner for membrane that has become dirty or contaminated prior to heat welding.
   a. **Stevens EP Seam Cleaner**: Specifically formulated for Stevens EP membrane and **is not** approved for use with Stevens EV (Elvaloy®) membrane.
   b. **Acetone** (by others): Recommend for use as a seam cleaner on Stevens EV membrane and **is not** approved for use with Stevens EP (TPO) membrane.
7. **Stevens Insulation Adhesives:** Stevens offers multiple insulation adhesive options.

Stevens Insulation Adhesives are designed for bonding most insulation and recover boards to a wide range of substrates and other insulation boards. Please consult the appropriate Product Specification Data Sheet for detailed information.

a. Stevens Insulation Adhesive is a VOC-free, one-part, rising, moisture-cure foam that is poured from 1 or 2.5 gallon cans on the substrate.

b. Stevens-Olybond 500 is a two part, polyurethane low rise foam that is applied in ribbons with appropriate dispensing equipment.

c. Stevens-Olybond Classic is a two part, polyurethane low rise foam that is spray applied to fully cover the substrate.

C. Insulation: Rigid insulation and cover board shall be provided by Stevens. A cover board of the type and thickness described herein must always be used over rigid insulation boards (polyisocyanurate, extruded polystyrene and expanded polystyrene) but is not required over approved cellular insulating concrete.

***NOTE:* Stevens Extruded Polystyrene with a min. compressive strength of 25 psi (170 kPa) is the only insulation product approved for use in a protected membrane assembly (insulation installed above the waterproofing membrane).**

1. **Stevens ISO 2000:** Closed-cell HCFC free "Green" polyisocyanurate foam core with integrally laminated heavy non-asphaltic, fiber-reinforced felt facers meeting Federal Specification HH-I-1972/2, Class 1 and ASTM C1289-95, Type II. Available with a 20 psi (140 kPa) or 25 psi (170 kPa) compressive strength rating. A minimum thickness of 1.5-in. shall be used.
2. **Stevens ISO 3000:** Closed-cell HCFC free "Green" polyisocyanurate foam core with integrally laminated heavy coated-glass facers meeting Federal Specification HH-I-1972/2, Class 1 and ASTM C1289-95, Type II. Available with a 20 psi (140 kPa) or 25 psi (170 kPa) compressive strength rating. A minimum thickness of 1.5-in. shall be used.
3. **Stevens extruded polystyrene** (XPS) boards meeting ASTM C578-98 with a compressive strength of 15 psi ([103 kPa] except as noted above). A minimum thickness of 1.5-in. shall be used.
4. **Stevens expanded polystyrene** (EPS) boards meeting ASTM C578-04a, with a minimum density of 1.35 pcf (22 kg/m^3, Type II) and a compressive strength of 18 psi (124 kPa). A minimum thickness of 1.5-in. shall be used.
5. **DensDeck Prime® cover board by Georgia Pacific:** Water-resistant gypsum core with integrally laminated glass mat facers. One side with a highly filled

proprietary heat-cured coating. A minimum 1/4-in. thick layer is required over polyisocyanurate, extruded polystyrene and expanded polystyrene insulation boards.

6. **Cellular Insulating Concrete** shall be composed of Type I Portland cement, a foaming agent and water with a minimum cast density of 30 lb/ft^3 (480 kg/m^3) and a minimum 200 psi (1.4 mPa) compressive strength.

D. Garden Roof Composite Drainage Panels: Used as a protection layer, root barrier and water retaining layer and is composed of a geotextile filter fabric that is factory laminated to a molded polystyrene core.

1. **Stevens GardenTop™ Drain 50RS:** 7/16-in. thick core (15,000 psf compressive strength) with a top layer of needle-punched 5.6 oz/ft^2 polypropylene fabric treated with RootShield™* to prevent root penetration and a 4.0 oz/ft^2 needle-punched polypropylene separation layer on the bottom.
2. **Stevens GardenTop™ Drain 100RS:** 1.0-in. thick core (9,500 psf compressive strength) with needle-punched 5.6 oz/ft^2 polypropylene fabric treated with RootShield™ to prevent root penetration and 4.0 oz/ft^2 needle-punched polypropylene separation layer.

E. Hardscape Items:

1. **Architectural Plaza Pavers:** Precast concrete plaza paver units nominal size 18-in.x 18-in. x 1.75-in. or 24-in.x 24-in. x 2-in., weighing a minimum of 20 psf with a minimum compressive strength of 6500 psi (per ASTM C 140).
2. **Paver Pedestal System:** Type and design as recommended by the plaza paver manufacturer. Pedestals serve to elevate the surface of the pavers above the roof membrane (and/or drainage composite, insulation, etc.) and to promote positive drainage for protection against the effects of freeze/thaw.
3. **Stone Ballast:** Nominal 3/4-in. to 1-1/2-in. diameter (ASTM D 448 #4 gradation) rounded washed stone applied at a minimum of 10 pounds per square foot.
4. **Growing medium:** Lightweight growing medium consisting of high-quality compost and recycled materials engineered to be water permeable; to retain water and air; to resist rot, heat, flying sparks, frost and shrinkage; to provide nutrients appropriate to the chosen plants; and to provide a rooting medium. Type and amounts as indicated by specifier.
5. **Additional Items:** Planters, trays, concrete curbs, landscape timber or other landscape products suitable for this application. Used to transition between growing media, roof top projections and other Garden Roof components. Type and amounts as indicated by specifier.
6. **Sedum:** Plant species used as for ground cover. Size, shapes, color and growth patterns as indicated by specifier/designer.

F. Mechanical fasteners: Shall be supplied by Stevens.

1. **Membrane:** Refer to Appendix A, *Stevens Fastener Selection Guide* to select appropriate fastener/plate combination. Also, Stevens Product Data Sheets contain additional information and can be found in the Stevens Technical Manual CD-Rom.
2. **Insulation:** Refer to Appendix A, *Stevens Fastener Selection Guide* and Appendix FA-B, *Approved Insulation List and Fastening Rates for Fully Adhered Systems* to select appropriate fastener/plate combination and approved fastening rates. Also, Stevens Product Data Sheets can be found on the Stevens Technical Manual CD-Rom.

G. Termination bar: Stevens Termination Bar fastened 6-in. o.c. is the only authorized material.

H. Stevens Edge Metal Systems: Stevens Edge Metal must be installed per Standard SR Drawing.

I. Prefabricated Stevens EP and Stevens EV Corners: Are provided as an alternative to .055-in. unsupported flashing for use at outside and inside corners.

J. Stevens Flashing Tape: 6-in. wide x 70-mils thick, packaged 100-ft. rolls. This product is made with unsupported membrane with a butyl tape backing (with a release paper) and is the preferred method for stripping-in non-Stevens gravel stop and drip edge metal (not for use on Stevens Clad Metal). Flashing Tape eliminates the need for Stevens Bonding Adhesive and Stevens All-Purpose Sealant

*RootShield™ - American Wick Drain, Monroe NC

when completing edge flashings. Surfaces must be prepared with Stevens Tape Primer prior to Flashing Tape application. Use of this product shall be limited to applications above the specified overburden components.

PART 3 - EXECUTION

3.01 Substrate Preparation

A. The contractor shall be responsible for the suitability of the substrate surface to accept Stevens membrane. In all cases, prior to the start of work, the substrate shall be smooth and free of debris, sharp edges, and other surface irregularities that will be detrimental to the installation. Any unevenness or joint gaps greater than 1/4-in. in the membrane substrate can cause inconsistent membrane welds and must be avoided. When occurring, fill with appropriate and properly secured insulation or material approved by Stevens Technical Review Dept.

B. Concrete: Membrane may be directly adhered to concrete when pre-approved by Stevens. Concrete must be dry, fully cured and prepared smooth with dust removed. The membrane shall have a fastened expansion joint detail (as per SR details) when crossing a building expansion joint.

C. Steel decks: A layer of Stevens thermal insulation shall be fastened or adhered in place. *(Reference Appendix FA-B, Stevens approved Insulation List and Fastening Rates for Fully Adhered Systems).* Polystyrene boards may require a thermal barrier underlayment over steel decks. Consult manufacturer and local building codes.

D. Vapor retarder: Is not required for protection of Stevens Roofing System Membrane. As a guideline, the National Roofing Contractors Association states, "...vapor retarders should be considered for use when both of two conditions are anticipated: (1) the outside mean, average January temperature is below 40°F (4.4°C), and (2) the expected winter, interior relative humidity is 45 percent or greater." *(CRREL report on vapor retarders for membrane systems can be used as further data as to the specific job requirement.)*

NOTE: **In all high humidity situations consult Stevens Technical Review Dept. and the insulation manufacturer for specific application requirements.**

E. Nailers: Pressure preservative treated, wooden nailers shall be installed at gravel stops or drip edges.

1. **New roofing:** As specified by architect/designer. A pressure preservative treated wood nailer is required to achieve effective perimeter attachment per approved details.
2. **All construction:** Nailer should be anchored with a suitable fastener for the application having a minimum withdrawal resistance of 100 lbs. staggered 6-in. o.c. within 8- ft. of an outside corner, and 12-in. o.c. along other perimeter areas.
3. **All construction:** Nailer thickness shall be chosen to match the top surface of adjacent construction ±1/4-in. This permissible variation shall not contribute to ponding.
4. **Nailers** around skylights, curbs, expansion joints, etc., are not required. Use of Stevens Plates and Screws anchored to deck 12-in. o.c. (except for buildings over 150 ft. high consult the Stevens Technical Review department for requirements).

F. New construction or reroof with complete tearoffs of flashings: The contractor shall be responsible for the suitability of the substrate surface to accept the Stevens membrane. The substrate shall be smooth and free of sharp edges and other surface irregularities that will be detrimental to the 100% adhesion of the flashing membrane.

3.02 Application Procedures

NOTE: **For insulation application and suitability refer to *Appendix FA-B, Stevens Approved Insulation List & Fastening Rates for Fully Adhered Systems*.**

A. Insulation or protection board:

1. **Minimum thickness:** Shall be approved in writing by Stevens. Since insulation requirement for thermal value will vary for each project, the thickness of the insulation must be calculated for the desired results.
2. **Specifications:** Consult Stevens Product Specification Data Sheets for information regarding flute spanability, compressive strength, etc.
3. **Precautions:** Be careful when handling insulation boards, as well as in their mechanical attachment, so as to not damage or rupture the facer and surface. All

damaged areas must be cut out and replaced with structurally sound insulation, properly secured in place.

4. **Attachment:** Insulation boards must be secured sufficiently to conform to the substrate surface geometry. Rigid insulation boards must be mechanically attached with Stevens insulation plates and appropriate Stevens fastener or shall be secured to the roof deck using a Stevens-supplied insulation adhesive. See Stevens Standard Detail SR-622A, SR-622B, SR-622C and Appendix FA-B, *Fully Adhered Approved Insulation List and Fastening Rates.*
   a. **Mechanical attachment:** All boards must be attached with FMG and Stevens-approved insulation plates and appropriate fasteners. (*Reference Appendix A, Stevens Fastener Selection Guide and Appendix FA-B, Stevens Approved Insulation List and Fastening Rates for Fully Adhered Systems).*
   b. **Adhered insulation with approved adhesive:** As an alternative to mechanical attachment, Stevens permits adhering insulation with a Stevens-supplied insulation adhesive. Stevens Insulation Adhesives are the only products eligible for Stevens warranty coverage. Insulation boards must be secured sufficiently to conform to the substrate surface geometry.
   c. **Adhered insulation with asphalt:** As an alternative to mechanical attachment, Stevens permits adhering insulation with hot steep asphalt (ASTM D-312 Type III or IV). The specific application must be approved in writing from the insulation board manufacturer and be approved by Stevens Technical Review Dept. All temperature requirements and application procedures must be followed. Insulation boards must be secured sufficiently to conform to the substrate surface geometry.
5. **Adhered Cover Board:** A minimum 1/4-in. layer of DensDeck® Prime shall be adhered to the rigid insulation boards using a Stevens-supplied insulation adhesive. A cover board is not required over approved cellular insulating concrete.
6. Approved insulation shall be laid with its end joints staggered. Boards shall be butted as closely as possible with no gaps over 1/4-in. and attached as specified in 3.02.A.4, 3.02.A.7.
7. **Tapered insulation:** Most tapered insulation systems taper down to a minimum 1/2-in. thickness only. Therefore, a tapered edge strip of high density fiber board must be used to provide a smooth transition to the flat areas.

B. Membrane Installation Procedures:

Note: **Be sure to use the appropriate adhesive instruction set for the membrane type being installed (refer to specification section 2.03.C for additional information or contact the Stevens Technical Review Dept.). Materials to be bonded should be clean, dry, and free of contaminates.**

1. **General (for all adhesives types):**
   a. For roofs with interior drainage, start with first sheet centered on drain valley. Fold sheet in half so that the bottom side of full length by half the width is presented.
   b. For roofs with edge drainage, start at the low edge with the first sheet and follow the procedure described in the preceding paragraph .
   c. If the substrate type prevents truly effective tie-off and inability to reach high points or complete roof by end of day, such a condition may dictate starting membrane at high points. However, this practice will result in laps “bucking” water flow and should be avoided whenever possible by taking the extra steps needed to reverse laps from one sheet to the next.
   d. At perimeters that are to receive a gravel stop or metal edging, the Stevens membrane must be brought over the outside edge and terminated 12-in. o.c. unless otherwise stated in the appropriate detail.
   e. Membrane must be mechanically attached 12-in. o.c. at all perimeters and at any penetration that has a dimension of 24-in. or greater with Stevens Fasteners and Plates.
2. **Stevens EP Fastline Membrane Adhesive by Ashland:** Approved for use with Stevens EP (TPO) non-fleece membrane only.

NOTE: **Outside ambient air temperature must be a minimum 50°F and rising.**

a. Apply the adhesive to the roof substrate in 1/2 – 3/4-in. (13 – 19 mm) wide beads spaced 12-in. (305 mm) O.C. This provides for an overall application rate of 200–250ft²/gallon (0.4 – 0.5 gallons/square [0.19–0.20 L/m²]) within field areas of the roof.

Note: **Within perimeter and corner areas of the roof, adhesive application rate should be increased by 100% (beads spaced no more than 6-in. [150 mm] on-center) to compensate for the higher uplift forces in these areas.**

b. Position the Stevens EP roof cover onto the adhesive beads and then roll the adhered area using a weighted roller (i.e. a smooth 3-ft. wide x 2-ft. diameter lawn roller filled with water), applying pressure to ensure adhesive spread and effective contact to the substrate.

c. Lay out the second sheet with a minimum 2-in. overlap on the edge of the first sheet. Perform lap splice per Section 3.02.C. After splice has cooled, completely expose the substrate under the second sheet by folding back along the splice. Apply adhesive beads to the substrate surface at the appropriate rate and carefully turn membrane back onto substrate surface avoiding any wrinkles or air pockets. Roll the adhered area as described above. Repeat procedure for each sheet proceeding across roof.

3. Stevens EP (TPO) Bonding Adhesive: Approved for use with Stevens EP (TPO) non-fleece backed membrane only.

NOTE: **Outside ambient air temperature must be a minimum 40°F and rising.**

a. With a roller, apply a 100% continuous coat of Stevens EP (TPO) Bonding Adhesive to the membrane and that area of substrate exposed by folding membrane back. Adhesive should never be broomed or mopped and must not be cut or extended. **Adhesive coverage should be 60 square feet per gallon for coating substrate and membrane. This results in a typical usage of approximately 10 gallons of adhesive per standard (76.5-in. x 100 ft.) roll of membrane if applied without excessive waste.** Cold weather, inconsistent spreading, and rough or porous substrate (i.e. concrete) will consume more adhesive. Reapply adhesive to any areas that have dried or skinned over.

b. Allow adhesive to dry to point of being tacky, but not sticky and stringy to the touch. When this point is reached, carefully unroll the glued portion of the membrane and lower it onto the glued substrate surface, avoiding any wrinkles or air pockets. Immediately roll the adhered area using a weighted roller (i.e. a smooth 3-ft. wide x 2-ft. diameter lawn roller filled with water), applying pressure to promote full contact. Membrane must have 100% adhesion to the substrate and several peel tests should be performed daily to ensure proper adhesion.

NOTE: **Use caution when applying solvent-based adhesives to a coverboard over polystyrene insulations so as to not allow liquid adhesive to drip between cover board joints, which can damage the insulation. Apply the adhesive evenly without creating puddles of liquid adhesive (especially at cover board joints) and never pour adhesive from the container directly onto the roof substrate.**

NOTE: **Extreme summer ambient conditions may dictate adhering smaller areas of membrane at a time to prevent over-drying of adhesive.**

NOTE: **If adhesive has been contaminated by blowing dust, moisture, walking in it, etc. it should be allowed to completely dry (no longer tacky) and new adhesive applied to both surfaces.**

c. Lay out the second sheet with a minimum 2-in. overlap on the edge of the first sheet. Perform lap splice per Section 3.02.C. After splice has cooled, completely expose the bottom side of the second sheet by folding back along the splice. Apply adhesive evenly to both underside of membrane and substrate surface, allow to dry to the point where the adhesive is tacky, and carefully turn membrane back onto glued substrate surface avoiding any wrinkles or air pockets. Roll surface using a weighted roller, applying pressure to promote full contract. Repeat procedure for each sheet proceeding across roof.

4. **Stevens EV (Elvaloy) Bonding Adhesive:** Approved for use with Stevens EV (Elvaloy) non-fleece backed membrane only.

NOTE: **Outside ambient air temperature must be a minimum 40ºF and rising.**

a. With a roller, apply a 100% continuous coat of Stevens EV Bonding Adhesive to the membrane and that area of substrate exposed by folding membrane back. Adhesive should never be broomed or mopped and must not be cut or extended. **Adhesive coverage should be 60 square feet per gallon for coating substrate and membrane. This results in a typical usage of approximately 10 gallons of adhesive per standard (76.5-in. x 100 ft.) roll of membrane if applied without excessive waste.** Cold weather, inconsistent spreading, and rough or porous substrate (i.e. concrete) will consume more adhesive. Reapply adhesive to any areas that have dried or skinned over.

b. Allow adhesive to dry to point of being tacky, but not sticky and stringy to the touch. When this point is reached, carefully unroll the glued portion of the membrane and lower it onto the glued substrate surface, avoiding any wrinkles or air pockets. Immediately roll the adhered area using a weighted roller (i.e. a smooth 3-ft. wide x 2-ft. diameter lawn roller filled with water), applying pressure to promote full contact. Membrane must have 100% adhesion to the substrate and several peel tests should be performed daily to ensure proper adhesion.

NOTE: **Use caution when applying solvent-based adhesives to a coverboard over polystyrene insulations so as to not allow liquid adhesive to drip between cover board joints, which can damage the insulation. Apply the adhesive evenly without creating puddles of liquid adhesive (especially at cover board joints) and never pour adhesive from the container directly onto the roof substrate.**

NOTE: **Extreme summer ambient conditions may dictate adhering smaller areas of membrane at a time to prevent over-drying of adhesive.**

NOTE: **If adhesive has been contaminated by blowing dust, moisture, walking in it, etc. it should be allowed to completely dry (no longer tacky) and new adhesive applied to both surfaces.**

c. Lay out the second sheet with a minimum 2-in. overlap on the edge of the first sheet. Perform lap splice per Section 3.02.C. After splice has cooled, completely expose the bottom side of the second sheet by folding back along the splice. Apply adhesive evenly to both underside of membrane and substrate surface, allow to dry to the point where the adhesive is tacky, and carefully turn membrane back onto glued substrate surface avoiding any wrinkles or air pockets. Roll surface using a weighted roller, applying pressure to promote full contract. Repeat procedure for each sheet proceeding across roof

5. **Stevens Fleece Water-based Adhesive** Approved for use with Stevens EP-Fleece and Stevens EV-Fleece membranes only.

NOTE: **Outside ambient air temperature must be a minimum 50ºF and rising.**

a. With a roller, apply a 100% continuous coat of Stevens Water-based Fleece Adhesive to the area of substrate where the membrane sheet is to be applied. Work evenly across the area to ensure membrane will be rolled into wet adhesive. Adhesive should never be broomed or mopped and must not be cut or extended. **Adhesive coverage should be 100 square feet per gallon and it is applied to the substrate only. An overall usage of 5-6 gallons of adhesive per standard (76.5-in. x 100 ft.) roll of membrane is typical if applied without excessive waste.** Cold weather, inconsistent spreading, and rough or porous substrate (i.e. concrete) will consume more adhesive. Reapply adhesive to any areas that have dried or skinned over.

b. Carefully unroll the membrane and lower it onto the glued substrate surface, avoiding any wrinkles or air pockets. Immediately broom the adhered area, applying pressure to promote full contact. Membrane must have 100% adhesion to the approved substrate.

NOTE: **Extreme summer ambient conditions may dictate adhering smaller areas of mem-**

brane at a time to prevent over drying of adhesive.

c. Layout the second sheet with a 2-in. overlap on the edge of the first sheet. Perform lap splice per Section 3.02.C. After splice has cooled, completely expose the bottom side of the second sheet by folding back along the splice. Apply adhesive evenly to substrate surface only, carefully turn membrane back onto glued substrate surface while adhesive is still wet, avoiding any wrinkles or air pockets. Apply only enough adhesive to an area of the substrate to ensure membrane will be rolled into wet adhesive. Broom surface applying pressure to promote full contract. Repeat procedure for each sheet proceeding across roof.

C. Lap splice: Membrane shall be overlapped and hot-air welded without any contaminants (adhesive, dirt, debris, etc.) prevalent in the seam.

1. **Hot-air welding:** An automatic hot-air welder and hand-held welder which are functionally in top condition are a necessity for Stevens applications. Small work and repairs can be done efficiently with the hand-held welders; however, hand-held welders are not a recommended means of field seaming.
2. **The entire lap edge must be probed** with approved seam probing tool (Sears cotter-pin extractor) after it has cooled completely to verify seam consistency. Probing before the seam area has cooled will damage the membrane. In addition there should be destructive tests performed daily on a 3-in. wide area of seam weld to verify good peel strength. A properly welded seam will have membrane delamination from scrim prior to weld failure. Destructive tests on welds should be done for the first seam of the day, first seam after the robot welder has been allowed to cool down, and after any extreme changes in weather conditions. Cut edges shall be caulked by applying Stevens Cut-Edge Sealant from a squeeze bottle (see Section 2.03.B.5).
3. **T-Seams**
   - **a. Definition:** The point where two perpendicular lap seams intersect is called a “T-seam” and if T-seams are not properly welded, a seam void may result.
   - **b.** For .045-in. and .060-in. membrane, T-seams should be properly creased in at the step-off area, using a hand roller. For T-seam locations that have not been welded properly, a patch is required. Patches shall be a minimum of 4-in. in diameter and can be either .045-in. reinforced Stevens EP membrane or .055-in. unsupported membrane.
   - **c.** For Stevens .080-in. thick membrane, a patch is required on all T-seam locations.
4. **Stevens EP and Stevens EV membrane, as with any material after exposure, will require cleaning prior to seaming.**

   The approved method for removing contaminants from the Stevens EP membrane prior to welding is as follows:

   - **a.** Remove any visible dirt and debris with a clean rag and water. For heavily contaminated surfaces, scrubbing with a detergent cleaner (i.e. Fantastik® or 409®) followed by a water rinse may be necessary.
   - **b.** With a clean scrub pad saturated with Stevens EP Seam Cleaner, aggressively agitate the seaming area. With a clean white rag, follow with a final one swipe pass over the seaming area, careful to not redeposit any contaminants back onto the cleansed sheet surface.
   - **c.** Allow Stevens EP Seam Cleaner to completely flash off (i.e. membrane should be completely dry).
   - **d.** Follow the standard hot-air welding procedures with an approximated 20% reduction in speed.
   - **e.** Final weld strength may not be achieved for several days.
   - **f.** For Stevens EV membranes, follow the above procedure (C.3.a –e) using Acetone instead of Stevens EP Seam Cleaner (refer to Section 2.03.6.b).

D. Perimeter fastening: Wood nailers are required for perimeter gravel stops or drip edges. Membrane may be fastened at other transitions (i.e. walls and curbs) by use of Stevens fasteners and seam plates.

1. **Wooden nailers:** See Section 3.01.E.
2. **Base of parapet or curb:** Membrane shall be mechanically fastened 12-in. o.c.

through Stevens Plate, Membrane, and insulation (and existing roof in reroofing) into deck. Fastening shall occur at parapet wall, curbs, skylights, expansion joints, and any other roof penetrations that exceed 24-in. in any dimension. *(See specific Standard SR Details for fastener location.)*

CAUTION: **Deck membrane must be adhered right up to or past these fastening points regardless of whether or not adhesive is shown in any detail that may be referenced.**

Note: **Refer to membrane restrictions in Section 2.03.A.**

E. Flashing: Perimeters, curbs, vents, expansion joints, drains, and other details shall be flashed as shown in Standard SR Detail Drawings. Under no condition shall flashings cover weep holes or any form of through-wall drainage.

Note: Stevens prefabricated pipe boots are not acceptable for use on GardenTop applications. Pipe Boots, by design, do not fit closely around the penetration and are likely to be crushed or damaged by the weight of overburden materials. Use alternative flashing methods shown in the Stevens Technical Manual (ref: SR-401, SR-402) and/or www.stevensroofing.com.

1. Apply Stevens Bonding Adhesive to both underside of flashing membrane and surface to which it is to be bonded, at a rate of approximately one gallon per 60 square feet when applied to both surfaces.

NOTE: **Stevens Bonding Adhesive shall not be applied to that portion of the flashing that overlaps onto itself. Hot-air welding shall be used throughout the system where Stevens membrane overlaps itself.**

2. Stevens Bonding Adhesive shall be allowed to dry until tacky to finger touch and until it does not string or stick to a dry finger. Roll the flashing into the dry adhesive. Care must be taken to assure that the flashing does not bridge where there is any elevation or directional change. Completely roll the flashing membrane against the substrate using a hand roller, J-roller or similar device applying pressure to the entire surface area.
3. All flashing shall be mechanically fastened at the top, under or through appropriate counterflashing with approved fasteners, and with approved SR termination details as shown in SR Detail Drawings.
4. Stevens Metal flashing at perimeter shall be made and installed as per Standard SR Details.
5. Pipe flashings shall be installed in accordance with Standard SR Details. Remove existing flashings and sleeves. Do not flash to lead.
6. Expansion joints shall be installed in accordance with Standard SR Details.
7. Roof drains shall be installed in accordance with Standard SR Details. In reroofing, old drains must be cleaned or replaced as needed for clamping detail. All bolts must be properly secured to supply 100% continuous compression of the clamping ring. Remove old leads and packings. Field seams shall not be run through drains.

F. Metal work: Metal work other than Stevens Edge Metal Systems is not covered by Stevens Warranty. Drain sleeves are not covered under warranty. However, pre-manufactured sleeve insert with clamping ring and backflow seal is recommended.

1. Metal work shall be installed in a manner that prevents damage from buckling or wind.
2. All metal work must be sealed and waterproofed in an acceptable manner.

G. Overnight seal/temporary water stop: Shall be made by a sealant method approved by Stevens to protect the insulation from inclement weather at the end of a day's work. The membrane is extended beyond the insulation and set into the approved overnight seal material. Roofing contractor shall coordinate installation to ensure the system is made watertight at the end of each workday.

H . Garden Roof Composite Drainage Panels :

1. **General:** Prior to installing any overburden over the membrane:
   - **a.** All roofing and flashing work must be 100% complete.
   - **b**. The system has to have been inspected by Stevens and approved for application of overburden.
   - **c.** Water test and other specified quality control procedures must be verified as having been completed successfully.
   - **d.** The surface of the waterproofing membrane must be free of dirt and debris of any kind in preparation for the application of overburden layers.

2. **Horizontal Surfaces:** Drainage panel may be loosely laid directly over the waterproofing membrane and the edges of the core with the flange should be at the higher edge (away from the drains). Panels must be secured if high winds are expected prior to the placement of overburden system. Minimize direct traffic on surface of the panels until wearing surface is in place. If drainage panel is damaged, check membrane beneath panel and repair both membrane and drainage panel before proceeding.
3. **Vertical Surfaces:** Drainage panel may be installed starting at the top or bottom of the wall. The roll may be installed either vertically (perpendicular to the wall) or horizontally (parallel to the wall). When installed vertically, the core flange should be at the upstream edge. This flange position minimizes seepage of water behind the panels. When installed horizontally, the edge of the core with the flange should be at the top.
4. **Corners:** Bend panel to make inside corners. For outside corners, cut drain core flush with corners leaving 3-in. of extra fabric. Wrap fabric around exposed edge of drain core, securing with tape to back side of core if necessary.

- **Roof walkways:** Shall be incorporated into the overburden system and are typically made from a series of high density paver units or similar materials. An approved protection layer must be installed between the paver system and the roof cover membrane. Walkway system shall be installed in accordance with the project specifications and drawings.

3.03 Application of Overburden

Note: **The following description represents a typical Intensive Garden Roof System construction. Variations in the design, components or application should be reviewed with the Stevens Technical Review Dept. at (877) 788-8324 to ensure suitability.**

A. General: Prior to installing any overburden over the membrane:

1. All roofing and flashing work must be 100% complete.
2. The system has to have been inspected by Stevens and approved for application of overburden.
3. Water test and other specified quality control procedures must be verified as having been completed successfully.
4. The surface of the waterproofing membrane must be free of dirt and debris of any kind in preparation for the application of overburden layers.

B. Stevens Garden Roof Drain 200H and 200V Panels:

1. **Horizontal Surfaces 200H:** Drainage panel may be loosely laid directly over the waterproofing membrane and the edges of the core with the flange should be at the higher edge (away from the drains). Panels must be secured if high winds are expected prior to the placement of overburden system. Minimize direct traffic on surface of the panels until wearing surface is in place. If drainage panel is damaged, check membrane beneath panel and repair both membrane and drainage panel before proceeding.
2. **Vertical Surfaces 200V:** Drainage panel may be installed starting at the top or bottom of the wall. The roll may be installed either vertically (perpendicular to the wall) or horizontally (parallel to the wall). When installed vertically, the core flange should be at the upstream edge. This flange position minimizes seepage of water behind the panels. When installed horizontally, the edge of the core with the flange should be at the top.
3. **Corners:** Bend panel to make inside corners. For outside corners, cut drain core flush with corners leaving 3-in. of extra fabric. Wrap fabric around exposed edge of drain core, securing with tape to back side of core if necessary.

C. Stevens Extruded Polystyrene (XPS) (min. compressive strength is 40 psi [275 kPa])**:**

1. Boards shall be installed with staggered end joints should be butted as closely as possible with no gaps over 1/4-in.
2. **Precautions:** Be careful when handling insulation to avoid damaging or rupturing the facer and/or surface. All damaged areas must be cut out and replaced with structurally sound insulation, and properly secured in place.

D. Stevens Garden Roof Drain 650 Panels:

1. **Horizontal Surfaces:** Drainage panel is loosely laid (fabric side up) directly over the (XPS) insulation layer(s) with the edges of the core with the flange at the higher edge (away from the drains). Panels must be secured if high winds are expected prior to the placement of overburden system. Minimize direct traffic on surface of the panels until wearing surface is in place. If drainage panel is damaged, check membrane beneath panel and repair both membrane and drainage panel before proceeding.
2. **Vertical Surfaces/Corners:** Refer to 3.03.B.2, 3.

E. Hardscape Items: Install growth medium and additional Hardscape items in strict accordance with the designers plans and instructions. Placement of overburden should proceed carefully so as to not damage previously installed layers.

3.04 Fastening Requirements

NOTE: **Fastening patterns are minimum 22-gauge steel, and minimum 2500-psi compressive strength structural concrete decks on buildings located within ASCE Ground Roughness Categories A, B and C *(See Table 3)*. For other types of deck construction, seacoast applications, and buildings with large wall openings such as hangar doors or truck docks, contact Stevens Technical Review Dept.**

A. Buildings up to 70 ft. high:

1. No additional requirement to those listed above for perimeters and penetrations.

B. Buildings over 70 ft. :

1. Consult the Stevens Technical Review department for requirements

Table 1 - Physical Properties - Stevens EP™

Physical Property	Test Method	Typical Values 60 mil* (1.52 mm)	Typical Values 80 mil* (2.03 mm)
Breaking Strength	ASTM D-751	320 lbf.(1.4 kN)	390 lbf. (1.7 kN)
Tear Strength	ASTM D-751 Procedure B, 8"x8" sample)	110 lbf.(.49 kN)	104 lbf. (.46 kN)
Dimensional Stability (% change max.)	ASTM D-6878 (white: 6 hrs. @ 158°F/70°C)	±0.3	±0.2
Hydrostatic Resistance	ASTM D-751 (Method A)	425 psi (2.9 MPa)	510 psi (3.52 MPa)
Ozone Resistance**	ASTM D-1149 (70 hrs.@100°F/37.8°C)	Pass	Pass
Weather Resistance	Xenon Arc, ASTM D-6878 G-155; 5040 kJ/m² 0.35w/m² @ 340nm	No cracks, loss of breaking strength, or tear strength	No cracks, loss of breaking strength, or tear strength
	EMMAQUA (Concentrated Natural Sunlight) (ASTM G-90) 167 MJ/m² total UV radiant exposure	Pass	Pass
Puncture Resistance	FTM 101B (Method 2031)	400 lbf. (1.8 kN)	500 lbf. (2.2 kN)
Water Vapor Transmission	ASTM E-96 (Procedure B Condition BW @ 72°F/22.2°C)	0.035 Perms	0.035 Perms
Elongation (%) Ultimate**	ASTM D-412 (Die C)	700%	700%
Brittleness	ASTM D-2137 @ -49°F/-45°C	Pass	Pass
Water Absorption (max. % weight change)**	ASTM D-6878 D-471, (158°F/70°C for 7 days) Testing only one side section	±3	±3
Heat Aging	ASTM D-6878 D-573 (28 days @ 240°F/115°C)	Break: 320 lbf. (1.4 kN)	Break: 350 lbf. (1.56 kN)
Solar Reflectance (initial)	ASTM E-903	>70%	>70%
Thermal Emittance	ASTM E-408	>0.93	>0.93

*Thickness (nominal) per ASTM D-751 test method.
**Test performed on non-reinforced Stevens EP membrane.

Table 2 - Physical Properties - Stevens EV™

Physical Property	Test Method	Typical Values 60 mil* (1.52 mm)
Thickness over Scrim	ASTM D-751 Optical Method	0.020 in. (.508 mm)
Breaking Strength	ASTM D-751, Grab Method A	300 lbf. (1.3 kN)
Elongation @ Break min %	ASTM D-751 Method A	30
Seam Strength min % of Break	ASTM D-751 Grab Method A	90
Heat Aging min. % of Original	ASTM D-3045 (176°F/80°C for 56 days ASTM D-751 Grab Method A	90
Tear Strength min.	ASTM D-751 Tongue Tear Method B	60 lbf. (2.7 kN)
Low Temp. Bend	ASTM D-2136 -40°F/-40°C	Pass
Accelerated Weathering Test (5000 hrs. kJ/m²)	ASTM 4434 G-155 6300 kJ/m²	No cracks, no craze (7X magnification)
Linear Dimensional change % max.	ASTM D-1204 6 hrs. 176°F /80°C	±0.3
Static Puncture Resistance	ASTM D-5602 33 lbf. (15 kg) 73°F/23°C	Pass
Dynamic Puncture Resistance	ASTM D-5635 20J	Pass
Hemispherical Spectral Reflectance	ASTM E-903 Energy Star min. 65%	Pass

*Thickness (nominal) per ASTM D-751 test method.

Table 3 - ASCE Exposure Classification

ASCE Exposure Classifications Defined

ASCE (American Society of Civil Engineers) has defined the roughness of the terrain into four "ground roughness" categories, or "exposures".

Exposure A	This classification applies to large city centers with at least 50 percent of the buildings having a height in excess of 70 feet (21.3 m). Use of this exposure category shall be limited to those areas for which representative terrain prevails in the upwind direction for a distance of at least one-half mile (0.8 km) or 10 times the height of the building or structure, whichever is greater. Possible channeling effects or increased velocity pressures due to the building or structure being located in the wake of adjacent buildings shall be taken into account.
Exposure B	Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of a single-family dwelling or larger. Use of this exposure category shall be limited to those areas for which representative terrain prevails in the upwind direction for a distance of at least 1,500 feet (460 m) or 10 times the height of the building or structure, whichever is greater.
Exposure C	Open terrain with scattered obstructions having heights generally less than 30 feet (9.1 m). This category includes flat, open country and grasslands.
Exposure D	Flat, unobstructed areas exposed to wind flowing over open water for a distance of at least one mile (1.61 km). This exposure shall apply only to those buildings and other structures exposed to the wind coming from over the water. Exposure D extends inland from the shoreline a distance of 1,500 feet (460 m) or 10 times the height of the building or structure, whichever is greater.

STEVENS ROOFING SYSTEMS FASTENER SELECTION GUIDE

APPENDIX A

PRODUCT DESCRIPTION:

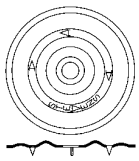
Stevens #14 All-Purpose Fastener

All-purpose fastener for membrane and insulation attachment. Use with 2-inch (50-mm) BMSP or Hex Insulation Plate.

SIZE AVAILABLE:
1¼, 2, 3, 4, 5-8-inch (30, 50, 75, 100, 125 - 200 - mm) in 1-inch (25-mm) increments and 10 and 12-inch (250 and 300-mm).

DECK TYPE:
Structural concrete (pre-drilling required), wood and 18 to 26 (1.3 - .55-mm) gauge steel.

PACKAGING:
1¼ - 6-inch (30 - 150-mm): 1000/bucket
7, 8, 10, 12-inch (175, 200, 250, 300-mm): 500/bucket



PRODUCT DESCRIPTION:

Stevens 2-in. (50 mm) Barbed Metal Seam Plates (for membrane attachment)

2-inch (50-mm) Galvalume® coated steel barbed seam plate for use with Stevens #14-10 fasteners or Stevens CD-10 concrete fasteners.

SIZE AVAILABLE:
2-inch (50-mm) round barbed

DECK TYPE:
NA

PACKAGING:
1,000/bucket

PRODUCT DESCRIPTION:

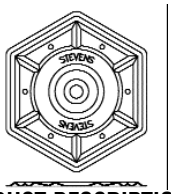
Stevens #12 Insulation Fastener

General purpose fastener for insulation attachment. Use with Hex Insulation Plate.

SIZE AVAILABLE:
$1^{5/8}$, 2¼, $2^{7/8}$, 3¼, 3¾, 4½, (41, 57, 73, 85, 95, 114-mm) 5 - 8-inch (125 - 200-mm) in 1-inch (25-mm) increments

DECK TYPE:
Wood and 18 to 26 (1.3 - .55-mm) gauge steel

PACKAGING
$1^{5/8}$ - 6-inch (41 - 150-mm): 1000/bucket
7 and 8-inch (175 and 200-mm): 500/bucket



PRODUCT DESCRIPTION:

Stevens Hex Insulation

$2^{7/8}$-inch (73-mm) Hex-shaped Galvalume coated steel insulation plate for use with Stevens #12, #14 or Stevens CD-10 concrete fasteners.

SIZE AVAILABLE:
$2^{7/8}$-inch (73-mm) diameter

DECK TYPE:
NA

PACKAGING
1000/box

PRODUCT DESCRIPTION:

Stevens Maxfast Fasteners

A large diameter head fastener for membrane attachment. Use with Maxfast Plate only.

SIZE AVAILABLE:
2 - 8-inch(50 - 200-mm) in 1-inch (25-mm) increments

DECK TYPE:
FM approved minimum 22 gauge steel* [*Test drill to check for installability on 18 and 20 (1.3 - 2.5-mm) gauge steel decks prior to committing to a project].

PACKAGING:
2 and 3-inch (50 and 75-mm): 1000/bucket
4 - 6-inch (100 - 150-mm): 500/bucket
7 and 8-inch (175 and 200-mm): 250/bucket

PRODUCT DESCRIPTION:

Stevens Maxfast Plate

A 3-inch (76-mm) diameter plate for use only with the Stevens Maxfast Fastener for membrane attachment.

SIZE AVAILABLE:
3-inch (76-mm) diameter

DECK TYPE:
NA

PACKAGING:
500/bucket

PRODUCT DESCRIPTION:

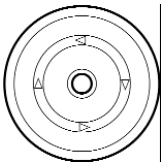
Stevens Purlin Fasteners

A roofing fastener for membrane attachment to structural steel purlins in standing seam metal roof retrofit applications.

SIZE AVAILABLE:
Overall Length: 3¾, 4¾, 5¾, 7 and 8-inch (95, 120, 146 , 178 and 200-mm)
Note: Usable length is ¾-inch (19-mm) less than overall length to allow the screw to quickly drill thru the purlin before the threads engage.

DECK TYPE:
18-12 (1.3 - 2.5-mm) gauge steel

PACKAGING:
500/box



PRODUCT DESCRIPTION:

Stevens 2" Purlin Plate

A 2-inch (50-mm)diameter barbed metal seam plate designed to accommodate the head of the Stevens Purlin fastener. Use of other Stevens Plates may be necessary depending on project requirements.**

SIZE AVAILABLE:
2-inches (50-mm)

DECK TYPE:
NA

PACKAGING:
1000/box

PRODUCT DESCRIPTION:

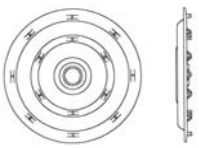
Stevens DeckGrip Fastener

#15 fastener for membrane and insulation attachment. Used for Stevens EP and EV membrane

SIZE AVAILABLE:
1¼,, 2, -8, 10, 12, 14 and 16-inch (30, 50 - 200, 250, 300, 355 and 406-mm)

DECK TYPE:
Structural concrete (pre-drilling required), wood and 18 to 26 (1.3 - .55-mm) gauge steel.

PACKAGING:
1¼ (30-mm) 2, -5 -inch (50 -125-mm): 1000/box
6, 7, 8 , 10, 12, 14-inch (150, 175, 200 250, 300, 355-mm): 500/box
and 16-inch (406-mm)250/box



PRODUCT DESCRIPTION:

Stevens DeckGrip Plate

Galvalume steel seam plate featuring a unique patented "Eye Hook" design.

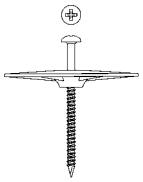
Stevens DeckGrip Reel-Fast Collated Seam Plates for easy installation. Spaced 6-in.(150 mm) or 12-in. (300 mm) o.c. (see separate datasheet)

SIZE AVAILABLE:
2 3/8-inch (60-mm)

DECK TYPE:
NA

PACKAGING:
1000/bucket

APPENDIX A



PRODUCT DESCRIPTION:

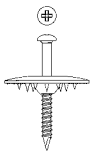
Stevens PIF (Preassembled insulation plate & fastener)

Preassembled #12 (black) fastener with 3-inch (75-mm) (blue) locking plate for insulation attachment.

SIZE AVAILABLE:
2¼, 2 7/8, 4½, 5 - 8-inch (57, 73, 114, 127 - 200-mm) in 1-inch (25-mm) increments plus 10 and 12-inch (250 and 300 -mm). Other lengths available on special order.

DECK TYPE:
Wood and 18 to 26 (1.3 -.55 - mm) gauge steel.

PACKAGING
2¼ - 8-inch (57 - 200-mm): 250/box
10-inch (250-mm) and longer: 200/box



PRODUCT DESCRIPTION:

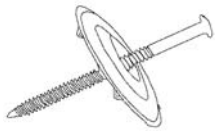
Stevens ASAP (Preassembled membrane seam plate & fastener)

All-purpose #14 fastener preassembled with 2-inch (50-mm) (gray) nylon locking plate for membrane attachment.

SIZE AVAILABLE:
2 - 8-inch (50 - 200-mm) in 1-inch (25 -mm) increments plus 10, 12, and 14-inch (250, 300, 355-mm) and other lengths available on special order.

DECK TYPE:
Structural concrete (pre-drilling required), wood and 18 to 26 gauge (1.3 - .55-mm) steel.

PACKAGING:
2 and 3-inch (50 and 75-mm): 500/per box; 4-inch (100-mm): 450/box; 5-inch (125-mm) 400/box;
6-inch (150-mm): 350/box;
7 and 8-inch (175 and 200-mm): 300/box;
10 - 12-inch (250 and 300-mm): 200/box;
14-inch (355-mm): 150/box



PRODUCT DESCRIPTION:

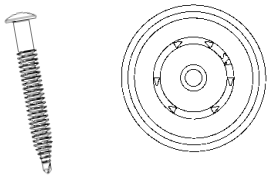
Stevens Preassembled DeckGrip

Preassembled membrane seam plate & fastener

SIZE AVAILABLE:
2 - 8, 10, and 12-inch (50 - 200, 250 and 300-mm)

DECK TYPE:
Structural concrete (pre-drilling required), wood and 18 to 26 gauge (1.3 - .55-mm) steel.

PACKAGING:
2 and 3-inch (50 and 75-mm): 500/box
4 - 8-inch (100 - 200-mm) 250/box
10,12-inch (250, 300-mm) 125/box



PRODUCT DESCRIPTION:

Stevens SW Fastener and Plate Kits

A "Superior Withdrawal" fastener for membrane attachment with 2 3/8-inch (60-mm) SW Barbed Metal Seam Plate.

SIZE AVAILABLE:
2 - 8-inch(50 - 200-mm) in 1-inch (25-mm) increments

DECK TYPE:
FM Approved minimum 22 (.85-mm) gauge steel* (*Test drill to check for installability on 20 (1.0-mm) gauge steel decks prior to committing to a project).

PACKAGING:
2 - 8-inch (50 - 200-mm) 250 fasteners and plates/bucket

PRODUCT DESCRIPTION:

Stevens CD-10 Concrete Fastener

Non-threaded hammer-in (spike type) fastener for membrane and insulation attachment.

SIZE AVAILABLE:
2 - 4-inch (50 - 100-mm) in ½-inch (13-mm) increments,
4 - 10-inch (100-250-mm) in 1-inch (25-mm) increments, and 12-inch (300 -mm)

DECK TYPE:
Structural concrete

PACKAGING:
2 - 8-inch (50 - 200-mm): 500/box
9-inch (228-mm) and longer: 250/box

PRODUCT DESCRIPTION:

Stevens Masonry Anchor

Hammer-in-type fastener for securing termination bar.

SIZE AVAILABLE:
1/4-inch (6-mm) diameter x 1¼-inch (30-mm) length

FOR USE IN:
Concrete and masonry

PACKAGING:
1,000/box

PRODUCT DESCRIPTION:

Stevens Termination Bar

Aluminum bar for use in membrane termination.
Refer to specific SR details.

SIZE AVAILABLE:
1-inch (25-mm) wide, 10-ft. (3-m) long
6-inch (150-mm)o/c slotted, punched

DECK TYPE:
N/A

PACKAGING:
500-ft. (152-m)/tube
50 pcs,10-ft. (3-m) long

STEVENS ROOFING SYSTEMS

Nine Sullivan Road, Holyoke, MA 01040 USA
Tel: 800/621-ROOF · Int'l: 1-413/552-1000 · Fax: 413/552-1070
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Appendix FA-B

STEVENS Approved Insulation List and Fastening Rates (Chart 5)

for Adhered Roofing Systems

Introduction

This is a listing of insulation and cover board products acceptable for use with Stevens Adhered Roofing Systems. Each listing shows specific manufacturer and product names, indicates which products are approved for retrofit applications and which are eligible for Stevens "Total System" Warranty coverage. In addition, fastening recommendations for each product type are shown.

Note: It is not within the scope of this chart to provide information relating to building code compliance, or specific Factory Mutual Global or Underwriters Laboratories, Inc. approvals. FMG, UL and/or building code requirements for insulation type, thermal barrier requirements, minimum/maximum insulation thickness and product pre-securement rates may differ from the Stevens requirements shown herein. Refer to the current edition of the FMG Approval Guide, the UL Roofing Materials and Systems Directory and/or the UL Fire Resistance Directory for complete information, or contact the Stevens Technical Review Dept. In addition, consultation with local building department is recommended to ensure compliance with applicable requirements.

General Recommendations

1) Refer to the product manufacturer's literature to confirm minimum allowable thickness required to span steel deck flutes, etc.
2) Adjacent insulation/cover boards shall be installed as closely as possible with no gaps or offsets greater than 1/4 inch.
3) A tapered edging of Stevens approved insulation is required at step transitions greater than 1/4-in. (as is typical for polyisocyanurate panels that taper to 1/2-in. only).
4) Approved insulation products shall be installed with the longest dimension of the board perpendicular to the direction of mechanically secured membrane lap seams whenever possible. Insulation end joints shall be staggered.
5) Insulation pre-securement fasteners/plates shall be installed at the rates shown herein and located on each board as shown in Stevens detail drawings SR-622A, 622B and 622C.
6) For applicable substrates, Stevens permits insulation boards to be adhered using a Stevens-supplied insulation adhesive, hot steep asphalt (ASTM D312, type III and IV) and some commercial insulation adhesive products. The insulation manufacturer, adhesive manufacturer and Stevens Technical Services must specifically approve such applications.
7) Consult the Stevens Technical Review Department at (877)788-8324 if the insulation manufacturer's current installation/securement instructions conflict with information published herein.

For Products Not Listed Herein

In the event that you wish to use an insulation product that does not appear on the Stevens Approved Insulation list, please contact the Stevens Technical Review Dept. at (877) 788-8324 for recommendations prior to commencement of the project.

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STEVENS Approved Insulation List and Fastening Rates (Chart 5)
for Adhered Roofing Systems

Insulation Type	Approved Manufacturers	Approved Product Name	Approved for Retrofit Applications	Approved for Stevens "Total System" Warranty	Fastening Rate for *Field Areas*[1] (see Note 2 for fastening rates at perimeter and corner areas)		
					Product Thickness of 1.4" and less	Product Thickness of 1.4" to 1.9"	Product Thickness of 2" and Greater
Gypsum Board	Georgia-Pacific Corp.	1/4" Dens-Deck®	(see note 3)	Yes	15 per 4'x 8' bd.	N/A	N/A
		1/4" Dens-Deck Prime®			12 per 4'x 8' bd.		
		1/2" Dens-Deck®	Yes		15 per 4'x 8' bd.		
		1/2" Dens-Deck Prime®			12 per 4'x 8' bd.		
	USG	1/4" Securock ®	Yes	Yes	10 per 4'x 8' bd	N/A	N/A
		3/8" Secrurock®					
		1/2" Securock ®					
		5/8" securock ®			8 per 4'x 8' bd		
Oriented Strand Board (OSB)	APA Rated Product	1/2" nominal thickness	Yes (when used as a cover board)	N/A	12 per 4'x 8' bd.; 6 per 4'x4' bd.	N/A	N/A
Polyisocyanurate	STEVENS Roofing Systems	Iso-2000, Iso-2000 Tapered, Iso-3000, Iso-3000 Tapered	Yes	Yes	16 per 4'x 8' bd.; 8 per 4'x4' bd.	11 per 4'x 8' bd.; 6 per 4'x4' bd.	8 per 4'x 8' bd.; 4 per 4'x4' bd.
	Atlas Roofing Corporation	AC Foam II®, AC Foam III®	Yes		16 per 4'x 8' bd.; 8 per 4'x4' bd.	11 per 4'x 8' bd.; 6 per 4'x4' bd.	8 per 4'x 8' bd.; 4 per 4'x4' bd.
	Dow Chemical Company	Hy-Therm AP®	Yes		16 per 4'x 8' bd.; 8 per 4'x4' bd.	16 per 4'x 8' bd.; 8 per 4'x4' bd.	8 per 4'x 8' bd.; 4 per 4'x4' bd.
		Hy-Therm Composite®					
	Dyplast Products, LLC	dpFOAM II™, dpFOAM III™		N/A		12 per 4'x 8' bd.; 6 per 4'x4' bd.	
	Firestone Building Products	ISO 95+®, ISO 300					
	Hunter Panels, LLC	H-Shield					
	Johns Manville Corp.	ENRGY 3™ (flat & tapered)				16 per 4'x 8' bd.; 8 per 4'x4' bd.	
	Rmax, Inc.	Multi-Max® FA		Yes			11 per 4'x 8' bd.; 5 per 4'x4' bd.
Wood Fiberboard	Knight-Celotex	StructodekTM	N/A	N/A	16 per 4'x 8' bd.; 8 per 4'x4' bd.	N/A	N/A
	IKO	Armourdeck					
	Georgia-Pacific Corp.	High Density Roof Fiberboard					
	Temple Inland	HD-1, HD-6	Yes	Yes	12 per 4'x 8' bd.; 6 per 4'x4' bd.		

Notes:

1. The fastening rates shown in this chart are applicable for buildings with a height of 70' and less that are located in an ASCE exposure category "A", "B" or "C" (See "Exposure Classification Table" in Stevens Guide Specifications). For fastening variations for buildings over 70' high, buildings in Exposure Category "D" and buildings with abnormal interior conditions, refer to the Adhered System Guide Specifications or contact the Stevens Technical Services Dept. The fastening rates shown here do not necessarily meet the requirements for Factory Mutual Global (FMG) Windstorm Resistance designs. Refer to the FMG "Approval Guide" or contact the Stevens Technical Services.

2. Stevens recommends that the fastening rates shown for the Field areas of the roof be increased by 50% at perimeter areas and 75% at corner areas. The extent of perimeter/corner enhancement is based on the smaller value of either 40% of building elevation or 10% of the least horizontal dimension and can not be less than 4% of the least horizontal dimension, or 3-ft. Contact the Stevens Technical Services Dept. at (877)788-8324 with questions.

3. This product is not approved as a recovery layer directly over gravel-surfaced B.U.R. roof systems. It is approved for use over existing single-ply and smooth or mineral surfaced roof systems.

4. Other insulations / cover boards may be used beneath the products referenced here. Refer to the listing in the Mechanically Attached System Guide Specifications.