

STEVENS ROOFING SYSTEMS PAVER BALLASTED STEVENS EP™

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CSI Division 7 Guide Specifications

PAVER BALLASTED

STEVENS EP™

PART 1 - GENERAL

1.01 Description

- A.** Furnish and install ballasted Stevens EP Roofing Systems in accordance with drawings and specifications approved by Stevens Roofing Systems (“Stevens”).

Special Conditions

1. This specification is intended for building roofs that have deck structures having sufficient load-carrying capacity and meeting the guidelines herein and which have no abnormally severe or unknown environmental exposures, e.g. coastal winds, or certain chemicals, except as specifically authorized herein.
2. Applications that require a Stevens Paver Warranty and any applications that involve severe exposures (ASCE Ground Roughness Category D) must be reviewed by Stevens Roofing Systems Technical Review Dept., before any specification is valid (*Reference Table 2, ASCE Exposure Classification Chart*).

WARNING: Buildings operating with interior positive pressure at the deck require review by Stevens Technical Review Dept. before any specification is valid.

- B. Related work:** Metal work other than Stevens Edge Metal Systems is not covered by Stevens for 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 applicator authorized by Stevens.
- B.** Stevens EP membrane is classified by Underwriters Laboratories as a Class A sheathing

material for use in construction of Class A roofing assemblies. See UL’s *Roofing Materials and Systems Directory* for specific assemblies.

- C. Inspection:** Upon completion of the membrane installation and **before the installation of the ballast paver system**, an inspection will be performed by a representative of Stevens to ascertain that the roofing system has been installed according to Stevens approved specifications and details. The applicator shall provide temporary ballast and protection as necessary but maintain all seams uncovered until an inspection by Stevens confirms the project is ready for installation of the Stevens Paver ballast system. Upon approval of the project, a Warranty shall be written.
- D. 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 Stevens Paver units can be installed in stages to secure the membrane.
- E. Changes:** Should there be deviations or changes from this specification without written approval of Stevens, the project is not authorized for installation and is not eligible for warranty.
- F.** All Stevens EP membrane is manufactured in an ISO-9001:2000 facility.

1.03 Submittals

- A.** Minimum job file submittal information for warranty coverage consideration 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 and SRP Detail Drawings must be shown as to their anticipated construction.

- C. Perimeter and penetration detailing shall require both an SR and SRP standard detail reference to specify both the membrane and the paver installation, respectively.
- 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 warnings, storage conditions, lot numbers, and usage instructions.
- B. Materials shall be stored in their original undamaged packaging and storage conditions shall be maintained in accordance with all manufacturers' requirements.
- C. Stevens Pavers are packaged and plastic wrapped on wood pallets. Check with your Stevens representative to determine the number of units and weight per pallet.
- D. Pallets of Stevens Pavers can be stored on the ground in a secure area. If placed on a roof, the load must not exceed the structural capacity of the deck.

1.05 Precautions

- A. Adhesives, solvents, and caulks as indicated are extremely flammable and/or toxic. Follow precautions indicated on containers or carton 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.
- C. All fasteners should be installed with a depth sensing screw gun to prevent overdriving or underdriving. The ASAP and PIF adapter tools are recommended to be used for the installation of Stevens ASAP and PIF fasteners. Insulations shall be loose laid. If the owner or specifier requires insulation fastening, a protection layer shall be required on top of the membrane, over fasteners and plates to prevent impingement on the membrane. Consult Stevens Technical Review Dept. for recommendation.
- D. Block off or shut down positive pressure building

ventilation systems during application to prevent sheet from billowing during application.

- E. 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.
- 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.
- H. Grease shall not be allowed to accumulate on to the roof. If rooftop grease units are not to receive 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 EP membrane or caused by faulty installation may require total recover in those areas.
- J. Roof surface shall be free of ponded water, snow, ice, and all debris in order to provide proper uniform surface for installation of pavers.
- K. Provide temporary ballast in partially completed sections to control wind effects during construction. Temporary ballast shall have no sharp edges, protrusions, chemical contaminants, etc., which could damage the roof membrane. Install Stevens Paver Ballast System as soon as possible over completed membrane areas, after passing membrane system inspection.
- L. Protect the membrane, insulation, and installed areas of pavers from damage when transporting pallets of pavers or other material. Place 3/4-in. plywood sheets, or similar product, in the traffic path or use carts with balloon-type tires and reduce loads to quantities that do not exceed the compressive strength of the substrate.
- M. Care shall be taken to minimize damage to the paver units during handling and installing.
- N. All substrates and insulation to receive Stevens Pavers shall provide a minimum 17 psi compressive strength.
- O. Stevens Pavers are designed to withstand general pedestrian roof traffic from maintenance crews and similar loads. Uneven substrates or insulation with low compressive strengths which

Table 1 - Physical Properties - Stevens EP

Physical Property	Test Method	Typical Values 45 mil* (1.14 mm)	Typical Values 60 mil* (1.52 mm)	Typical Values 80 mil* (2.03 mm)
Breaking Strength	ASTMD-751	275 lbf.(1.2 kN)	320 lbf.(1.4 kN)	390 lbf. (1.7 kN)
Tear Strength	ASTMD-751 Procedure B, 8"x8" sample)	135 lbf.(.60 kN)	110 lbf.(.49 kN)	104 lbf. (.46 kN)
Dimensional Stability (% change max.)	ASTM D-6878 (white: 6 hrs. @ 158°F/70°C)	±0.3	±0.3	±0.2
Hydrostatic Resistance	ASTMD-751 (Method A)	400 psi (2.8 MPa)	425 psi (2.9 MPa)	510 psi (3.52 MPa)
Ozone Resistance**	ASTMD-1149 (70hrs.@100°F/37.8°C)	Pass	Pass	Pass
Weather Resistance	Xenon Arc, ASTM D-6878 G-155; 5040 kJ/m ² 0.35w/m ² @ 340nm	No cracks, loss of breaking strength, or tear strength	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/m ² total UV radiant exposure	Pass	Pass	Pass
Puncture Resistance	FTM 101B (Method 2031)	330 lbf. (1.5 kN)	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	0.035 Perms
Elongation (%) Ultimate**	ASTMD-412 (Die C)	700%	700%	700%
Brittleness	ASTMD-2137 @ -49°F/-45°C	Pass	Pass	Pass
Water Absorption (max. % weight change)**	ASTMD-6878 D-471, (158°F/70°C for 7 days) Testing only one side section	±3	±3	±3
Heat Aging	ASTMD-6878 D-573 (28 days @ 240°F/115°C)	Break: 275 lbf. (1.2 kN)	Break: 320 lbf. (1.4 kN)	Break: 350 lbf. (1.56 kN)
Solar Reflectance (initial)	ASTM E-903	>70%	>70%	>70%
Thermal Emittance	ASTME-408	>0.93	>0.93	>0.93

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

may deform, might cause excessive tensile stress in pavers, and some minor cracking and chipping is to be expected. In most cases, the performance of the Stevens Paver Ballast System will not be diminished.

- P.** A slip sheet shall be installed for areas having regular roof traffic. (Reference paragraphs 3.03.C.4). If equipment is to be rolled across the roof, provisions shall be made to minimize cracking the pavers by placing plywood sheets in the traffic path and the use of wide- tread tires.
- Q.** Do not install pavers atop fresh, not yet set, caulking or sealants for the membrane and metal flashings. Allow the materials to cure to a nonstick surface condition prior to installing pavers.
- R.** Do not roll or place window washing rigs directly on Stevens Paver units.

1.06 Warranty

- A.** A Stevens representative shall inspect the installation for compliance with applicable Stevens specifications prior to the application of the paver ballast. If ballasting prior to this inspection is necessary, row ballasting or spot

ballasting is acceptable providing all seams are left exposed. After paver system is completed Stevens will perform the job completion inspection.

- B.** Upon acceptance through inspection, a Stevens Standard or Total System Warranty for a five (5), ten (10), or fifteen (15) year period that covers wind damage at up to 60 mph.
- C.** A warranty of up to 120 mph design wind speed is available with Stevens Paver Ballast System upon approval by Stevens Technical Review Dept.
- D.** See General Warranty section of the Stevens CD-Rom for more information.

PART 2 - PRODUCTS

2.01 General

- A.** All material shall be furnished, specified or approved in writing by Stevens. Samples of all materials used on the project that are not supplied by Stevens shall be furnished to Stevens for written approval prior to the start of work.

2.02 Membrane

- A.** Membrane for roof cover shall be .045-in., .060-in., or .080-in. (Stevens EP-XL) nominal thickness overall, scrim reinforced, Ethylene Propylene-based sheet 76.5-in. wide by appropriate length conforming to the minimum physical properties in [Table 1, Physical Properties Chart](#). (Factory fabricated 10-ft. and 12-ft. widths are also available for .045-in. and .060-in. thick materials only. Contact Stevens Technical Review Dept. for more information.) Stevens EP membrane is available in White, Light Slate Gray, Pewter, Buckskin, Desert Brown, Terra Cotta, Patina, Dark Ivy Green and Neon Blue. Contact your Stevens Representative for color, thickness options, minimums and lead times. Stevens EP Membranes meet the ASTM 6878-03 specification for TPO-based roofing material. Packaging to bear the UL label.

2.03 Pavers

- A.** The Stevens Paver Ballast System shall consist of products from a Stevens-approved paver manufacturer.
- B.** The Stevens Paver Ballast System shall consist of shiplap interlocking concrete ballast pavers that have been designed specifically for ballasting loose-laid roofing systems. The pavers will provide for four-way drainage. **ONLY ACCESSORIES SUPPLIED OR APPROVED BY STEVENS FOR THE STEVENS EP PAVER BALLAST SYSTEM ARE ACCEPTABLE**
- C.** Color shall be as selected by the architect/engineer. Standard color available through all outlets is gray. Special colors can be manufactured upon request.
- D. Constituents**
1. Aggregate shall consist primarily of conventional sand conforming to ASTM C331.
 2. Portland cement shall conform to ASTM C150, Type I, Type II, or Type III specifications.
 3. Other constituents: Coloring pigments, and other additives shall conform to the applicable ASTM standards.

E. Physical Properties:

Pavers (12 psf nominal)

1. Nominal dimensions:
 - a. Standard block: 11-3/4 in. x 16-1/2 in. ($\pm 1/8$ -in.).

2. Unit weight: 12 psf \pm .75 lbs.
3. Unit density of concrete: 145 lb./cf (nominal).
4. Compressive strength of concrete: 5000 psi
5. Maximum water absorption: 5%
6. Surface bearing area: 30 sq. in./sq. ft. (approx.).
7. Packaging: Palletized not to exceed 2,500 pounds.

2.04 Related materials

A. Insulation/underlayment/recover

board: Stevens supplies a wide range of insulations, underlayments and coverboards to satisfy a broad spectrum of design conditions. Only Stevens brand insulation products will be eligible for Total System Warranty coverage: products other than Stevens will incur a premium warranty fee. (*Reference Appendix MA-B, Stevens Approved insulation List and Fastening Rates for Mechanically Attached Systems*).

1. **Stevens ISO 2000:** Closed-cell HCFC FREE “Green” polyisocyanurate foam core manufactured using (HCFC) (ACUUltra Hydrocarbon) blowing agent and integrally laminated to heavy non-asphaltic fiber-reinforced felt facers; compressive strength - (20 psi) (25 psi). Available in flat stock and tapered panels. (*Reference Stevens Product Specification Data Sheets for additional information*).
2. **Stevens ISO 3000:** Closed-cell HCFC FREE “Green” polyisocyanurate foam core manufactured using (HCFC) (ACUUltra Hydrocarbon) blowing agent and integrally laminated to heavy coated-glass facers; compressive strength - (20 psi) (25 psi). (*Reference Stevens Product Specification Data Sheets for additional information*).
3. **Stevens ISO Recover Board:** Closed-cell HCFC FREE “Green” polyisocyanurate foam core manufactured using (HCFC) (ACUUltra Hydrocarbond) blowing agent and integrally laminated to heavy coated-glass facers; compressive strength - (20 psi) (*Reference Stevens Product Specification Data Sheets for additional information*).
4. **Stevens Extruded Polystyrene (XPS):** Extruded polystyrene closed-cell foam panel with continuous skin on face and back surface that meets ASTM C-578, Standard

Specification for Rigid Cellular Polystyrene Thermal Insulation. (*Reference Stevens Product Specification Data Sheets for additional information*).

5. Stevens Expanded Polystyrene (EPS):

ASTM C578-04a expanded polystyrene thermal rigid board insulation with a minimum density of 1.25 lbs./cu.ft.(ft3). (*Reference Stevens Product Specification Data Sheets for additional information*).

6. DensDeck® Roof Boards: (*Reference Stevens Product Specification Data Sheets for additional information*).

a. G-P Gypsum Corporation 1/4-in. DensDeck Roof Board, 1/2-in. DensDeck Roof Board and 5/8-in. Type X Roof Board. Nonstructural, glass mat faced gypsum panel with water-resistant core available in 4-ft.x8-ft. sizes and 4-ft.x4-ft.sizes

b. G-P Gypsum Corporation 1/4-in. DensDeck Prime Roof Board, 1/2-in. DensDeck Prime Roof Board and 5/8-in. DensDeck Prime Roof Board (Type X). Glass mat faced gypsum with non-asphaltic, highly filled proprietary heat-cured coating on one side available in 4-ft.x8-ft. and 4-ft.x4-ft. sizes.

c. G-P Gypsum Corporation 1/4-in. DensDeck DuraGuard, 1/2-in. Densdeck Duraguard and 5/8-in. DensDeck Duraguard. Glass mat faced gypsum panel with blue low-perm, durable, integrated-coating on one side and coated glass mat on the back available in 4-ft.x8-ft. and 4-ft.x4-ft. sizes.

B. Flashing: Flashing shall be .045-in. thick membrane for walls and curbs regardless of roof cover sheet thickness. Unsupported .055 in.-thick, Ethylene Propylene-based membrane shall be supplied for vent stacks, pipes, drains, and corners.

C. Adhesives, sealants, primers and caulks:

1. Stevens EP (TPO) Bonding

Adhesive: Stevens EP (TPO) Bonding Adhesive is designed to adhere Stevens EP membrane flashing to wood, metal and masonry surfaces. Stevens EP (TPO) Bonding Adhesive **is not** approved for use with other roofing membranes.

2. Stevens All-Purpose Sealant:

Stevens All-Purpose Sealant is designed to be

used as a water cutoff mastic, sealant to top off pitch boxes, as an exterior grade caulk for metal work.

3. Stevens EP Cut Edge Sealant:

Stevens EP Cut Edge Sealant is a solvent-based caulk developed to seal exposed cut edges of reinforced membrane.

4. Stevens Insulation Adhesives: Stevens offers multiple insulation adhesive options.

- 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.

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.

5. Stevens EP Seam Cleaner: Stevens EP Seam Cleaner is a surface cleaner developed for use with Stevens EP membranes which have become dirty or contaminated prior to heat welding.

D. Mechanical fasteners: Shall be supplied by Stevens.

1. Membrane:

- a. Refer to *Appendix A, Stevens Fastener Selection Guide* 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.
- b. For gypsum, cementitious woodfiber decks (“Tectum”) and light-gauge metal panel roofs, fastener pull tests must be submitted to Stevens Technical Review Dept. with the project Request for Warranty form (RFW).

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

F. Stevens Edge Metal Systems: Stevens Edge Metal must be installed per standard SR Detail Drawings .

G. Prefabricated Stevens EP Pipe

Boots: Are provided as alternatives to .055-in. unsupported flashing for vent stacks and pipes 1-in. to 6-in.

H. Prefabricated Stevens EP Corners:

Are provided as an alternative to .055-in. unsupported flashing for use at outside and inside corners.

I. Stevens EP Flashing Tape: 6-in. wide x 70-mils thick, packaged in 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 (TPO) Bonding Adhesive and Stevens All-Purpose Sealant when completing edge flashings. Surfaces must be prepared with Stevens Tape Primer prior to Flashing Tape application.

J. Paver Connectors/adhesives: Shall be used to connect one paver unit to another as required by enhancement details and the use of cut-to-fit paver units.

K. Metal for paver securement: Shall be required for most paver perimeter areas. Consult the standard SRP Detail Drawings for particular specifications. Where the SRP Detail Drawing replaces rather than augments the SR flashing detail will be indicated on the SRP drawing.

B. Steel deck, wood plank, and light-weight cementitious decks:

Shall be covered with an approved insulation (*Reference Appendix MA-B, Approved Insulation List and Fastening Rates*). Polystyrene boards may require a thermal barrier underlayment over steel decks. Consult manufacturer and local building codes.

C. Concrete and plywood: Surface shall be dry, clean, smooth, free of sharp edges, and suitable for acceptance of Stevens EP membrane. Plywood must be exterior grade with an A or B finish side up and no joints gapped greater than 1/4-in. Consideration should be given to installing slip plates over all gapped or uneven joints where membrane seams will cross to minimize welding inconsistency. Thickness, structural grade, fastening, and fire resistance requirements should meet the requirements and recommendations of applicable building codes and the APA and are the responsibility of the owner and the installer. Concrete must be dry, fully cured, and prepared smooth with dust removed. The membrane shall have a fastened expansion joint detail (as per standard SR Detail Drawings) where deck joints exceed 1/4-in. or when crossing a building expansion joint.

D. Reroofing over existing roof: The specifier and/or applicator shall determine the condition of the existing roof. Significantly deteriorated decking must be repaired or replaced, as appropriate. Wet materials (containing free moisture that would evaporate if exposed to atmosphere) must be found and replaced. Existing surface shall be dry, reasonably smooth and even, blisters cut, and loose aggregate removed prior to installation of approved insulation board.

E. 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."

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

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

PART 3 - EXECUTION

3.01 Substrate preparation

A. The applicator is responsible for ensuring the suitability of the substrate to accept the Stevens EP membrane. In reroofing, test cuts shall be made by the roofing applicator to determine existing condition and deck suitability. All noticeably damp, wet, or deteriorated materials must be removed and replaced. In all cases, prior to the start of work, the substrate shall be smooth and free of debris, sharp edges, and other surface irregularities. Any unevenness or joint gaps greater than 1/4-in. in the membrane substrate can cause inconsistent membrane welds and must be avoided. When such conditions occur, fill with appropriate and properly secured insulation or material approved by Stevens Technical Review Dept. Maximum slope allowed is two (2-in.) in twelve inches (12-in.).

1. **Reroofing:** Use #2 or better wood treated for rot resistance. Creosote and asphaltic preservatives are not acceptable.
2. **New roofing:** As specified by architect. A pressure preservative treated wood nailer is recommended. Effective perimeter attachment must be achieved per standard SR Detail Drawings.
3. **All construction:** Nailer shall 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.
4. **All construction:** Nailer thickness shall be chosen to match the top surface of adjacent construction $\pm 1/4$ inch. This permissible variation shall not contribute to ponding.
5. **Nailers** around skylights, curbs, expansion joints, etc., are not required. Use of Stevens fasteners and plates anchored to deck 12-in. o.c. through membrane and insulation is acceptable.

G. Existing flashings: Must be removed and completely cleaned off wherever new Stevens Roofing System terminations and water stops are to be installed. Existing flashings may be left in place up to Stevens termination areas when in good structural condition and solidly attached to substrate.

H. New construction or reroof with complete tearoff of flashings: The applicator is responsible for the suitability of the substrate surface to accept the Stevens EP membrane. The substrate shall be smooth and free of sharp edges and other surface irregularities that prevent the flashing membrane from being 100% adhered.

3.02 Application procedures

Note: For insulation application and suitability, refer to **Appendix MA-B, Stevens Approved Insulation List & Fastening Rates.**

A. Insulation or protection board:

1. **Minimum thickness:** Shall be approved in writing by Stevens. Since the insulations requirement for thermal value will vary for each project, the thickness of the insulation must be calculated for the desired results.
2. **Compatibility:** Certain insulations such as polystyrene are not compatible with coal tar pitch. Contact manufacturer for

recommendations. Certain polystyrene insulations boards are not suitable for use directly under Stevens EP colors or Stevens EP Black membrane and require an overlayment (*Reference Appendix MA-B, Approved Insulation List and Fastening Rates*).

3. **Manufacturers' instructions:** In regard to attachment, compatibility and spanning of metal flutes, the manufacturers' instructions or specifications shall determine the suitability for an application, subject to acceptance by Stevens.
4. **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.
5. **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 should be used to provide a smooth transition to the flat areas.
6. Approved insulation boards shall be installed with the longest dimension perpendicular to the direction of the membrane seams whenever possible and installed with end joints staggered. Boards will be butted as closely as possible with no gaps over 1/4-in.

B. Membrane Installation Procedures:

1. Approved insulation shall be loose-laid with joints staggered over roof area to be covered. Boards will be butted as close as possible, and voids over 1/4-inch shall be filled.

Warning: If top surface alignment cannot be maintained to a maximum of 1/4-in. variation between board edges, the Stevens Pavers must be clipped in these areas to ensure acceptable interlock between units. Proper substrate preparation is essential to avoid such costs.

2. Stevens Field Sheet Membrane shall be unrolled on the area to be covered, with a minimum 2-in. overlap from the edge of the previous roll of membrane.
3. 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. (*Reference Appendix A, Fastener Selection Guide*). At perimeters that are to receive a

gravel stop or metal edging the Stevens EP membrane must be brought over the outside edge and terminated 12-in. o.c.

C. Lap splice: Membrane shall be overlapped and hot-air welded without any contaminants (adhesive, dirt, debris, etc.) 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 sufficient 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 had been allowed to cool down, and after any extreme changes in weather conditions. Cut edges shall be caulked by applying Stevens EP Cut-Edge Sealant from a squeeze bottle.

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 EP-XL (.080-in. thick membrane), a patch is required on all T-seam locations.

4. Stevens EP membrane, as with any material after exposure, will require cleaning prior to seaming. The approved method for cleaning 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, without redepositing any contaminants.
- 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.

D. Perimeter fastening: Wood nailers are required for perimeter gravel stops or drip edges. Membrane may be fastened at other terminations using Stevens fastener and seam plates (*Reference Appendix A, Stevens Fastener Selection Guide*).

1. Wooden nailers: See Section 3.01.F.

2. Base of parapet or curb: Membrane shall be mechanically fastened 12-in. o.c. through insulation (and existing roof in reroofing) into deck. Fastening shall occur at parapet walls, curbs, skylights, expansion joints, and any other roof penetrations that exceed 24 in. in any dimension.

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 flashing cover weep holes or any form of through-wall drainage.

1. Apply Stevens EP (TPO) 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 two surfaces) of surface coverage.

NOTE: Stevens EP (TPO) Bonding Adhesive shall not be applied to membrane surfaces that are to be hot-air welded. Hot-air welding shall be used anywhere throughout the system where Stevens membrane overlaps itself.

2. Stevens EP (TPO) Bonding Adhesive shall be allowed to dry until tacky and does not string or stick to a dry finger. Roll the

flashing into the dry adhesive. Care must be taken to ensure 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 to promote full contact.

3. All flashing shall be terminated as shown in standard SR and SRP Detail Drawings.
4. Stevens EP Metal flashing at perimeter shall be made and installed as per standard SR and SRP Detail Drawings.
5. Pipe flashings shall be installed in accordance with standard SR and SRP Detail Drawings.
6. Expansion joints shall be installed in accordance with standard SR and SRP Detail Drawings.
7. Roof drains shall be installed in accordance with standard SR and SRP Detail Drawings. 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. Drain sleeves are not covered under warranty. Prefabricated sleeve insert with a clamping ring and backflow seal are acceptable.
8. In some applications for gravel stops, drip edges, and gutters, the standard SRP Detail Drawings will establish the membrane perimeter flashing and termination specification as well as paver securement (*Reference specific SRP Detail Drawing*).
9. A protective medium weight nonwoven needle punched polyester slip sheet and/or piece of foam rod stock shall be set between paver units and membrane flashings wherever no other separator such as metal work prevents direct contact.

F. Metal work: Metal work other than Stevens Edge Metal Systems is not covered by Stevens Warranty.

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 inclem-

ent 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 applicator shall coordinate installation to ensure the system is made watertight at the end of each workday.

3.03 Application procedures ballast

A. The Stevens Paver System consists of full coverage of paver units.

1. Stevens Paver System and enhancement requirements shall be approved for each project by Stevens Technical Review Dept. prior to job bid and start.

B. Whenever conditions permit, the recommended perimeter securement details for the Stevens Paver System are:

1. SRP-13 at all gutter edges.
2. Stevens Fascia, Stevens Paver System version at gravel stop edges. (*See SRP-10.*)
3. Stevens Termination Bar Type 1 at all parapet edges and base of walls. (*See SRP-21.*)

C. Preparation of surface:

1. Insulation, roof membrane, and flashing shall be installed in accordance with Stevens specifications. A completion inspection of the membrane installation by a representative of Stevens is required prior to installing the Stevens Paver Ballast System.
2. Maximum width of insulation joints shall be 1/4-in., and the difference in height of adjacent insulation sheets shall not exceed 1/4-in.
3. Surface irregularities, membrane wrinkles, or similar conditions from uneven substrates that could prevent the interlocking of adjacent pavers shall be eliminated.
4. Install a slip sheet of medium to heavy weight (6 oz. or heavier) nonwoven polyester fabric between the pavers and the membrane in areas where regular roof traffic is expected (regular foot traffic is considered to be once a month or more) or where clips are installed. In the absence of well defined traffic routes, entire surface protection should be installed.

NOTE: Some metal edge paver enhancement details must be installed before the paver units. It is nearly always practical and lower risk to install edge enhancement before or at

the same time as laying the first course of paver units.

CAUTIONS: Use plywood or other substantial protection pads on all traffic routes where Stevens Paver units will be moved (or any other route with heavy construction traffic). This caution applies before and after the routes are laid with pavers.

D. Layout of pavers:

1. System design and schematic layout of paver system shall be supplied by Stevens upon review of individual projects qualifying for the Stevens Paver System warranty.

CAUTION: Using no smaller than half units and making cuts in the required direction will frequently require cutting two or more units to fill one irregular space. **SHORTCUTS ARE NOT ACCEPTABLE.**

E. Installation of Stevens Paver System:

1. It may be desirable that the paver units be taken from three or more pallets at the same time to blend variations in color.
2. Prior to setting each paver unit, sweep the membrane area immediately under the unit to remove concrete particles.
3. Stevens Paver Systems are not applicable for roofs that have a lack of proper drainage (no ponding 48 hours after rainfall).
4. Butt all paver units tightly together. Do not leave gaps between blocks. Discard any damaged units.

F. Installation Basics:

System Design #1

1. Straight bond paver configuration.
2. Upper shiplap of the paver can only be 1 1/4-in. maximum distance from the first roofing element along the parapet wall or roof edge.
3. The 11 3/4-in. dimension of the paver can be as much as 12-in. from the first roofing element along the parapet wall or roof edge.
4. Reverse the interlock at mid-roof ± 4 courses using either the cut to match or butt underlaps method.
5. Mechanically clip or adhere:
 - a. Two courses of pavers to one another around all roof protrusions (HVAC, roof drains, structural members).
 - b. Any pavers that are less than full size to the adjacent full size paver.
 - c. First two courses of pavers where the

11-3/4 in. dimension is adjacent to the roof edge.

System Design #2

1. Staggered bond paver configuration.
2. Upper shiplap of the paver can only be 1 1/4-in. maximum distance from the first roofing element along the parapet wall or roof edge.
3. The 11 3/4-in. dimension of the paver can be as much as 12-in. from the first roofing element along the parapet wall or roof edge.
4. Reverse the interlock at mid-roof ± 4 courses using either the cut to match or butt underlaps method.
5. Mechanically clip or adhere:
 - a. Two courses of pavers to one another around all roof protrusions (HVAC, roof drains, structural members).
 - b. Any pavers that are less than full size to the adjacent full size paver.
 - c. First two courses of pavers where the 11 3/4-in dimensions are adjacent to the roof edge.

System Design #3

1. Staggered bond paver configuration.
2. Pavers can only be 1 1/4-in. maximum distance from the first roofing element along the parapet wall or roof edge.
3. Reverse the interlock at mid-roof ± 4 courses using either the cut to match or butt underlaps method.
4. Mechanically clip or adhere:
 - a. Two courses of pavers to one another around all roof protrusions (HVAC, roof drains, structural members).
 - b. Any pavers that are less than full size to the adjacent full size paver.
 - c. First two courses of pavers where the 1 3/4-in. dimensions are adjacent to the roof edge.
5. Apply approved attachment around the entire perimeter.

System Design #4

1. Staggered bond paver configuration.
2. Pavers can only be 1 1/4-in. maximum distance from the first roofing element along the parapet wall or roof edge.
3. Reverse the interlock at mid-roof ± 4 courses using either the cut to match or butt underlaps method.

4. Mechanically clip or adhere all pavers to one another.
5. Apply approved attachment around the entire perimeter.

G. Mechanical enhancement at perimeters:

1. All perimeter attachment shall extend a minimum of 2-in. across the top horizontal surface of the pavers. This flange shall sit tightly against the top surface of the pavers.
2. Unless otherwise required by project design, metal terminations shall be designed and secured to provide an uplift resistance of at least 100 pounds per linear foot. Size and spacing of fasteners will depend upon fastener and substrate type but in no condition should fastener or anchor spacing exceed 12-in. o.c.
3. Refer to specific SRP Detail Drawing for additional information.

3.04 Protected membrane assemblies

- A. The Stevens Paver System is recommended for ballasting a protected membrane assembly where suitable insulation is installed over the Stevens EP membrane.

- B. Insulation products above and below membrane must be recommended for this type of application and be accepted by Stevens for the specific project.
- C. All assemblies must include a suitable stone mat fabric between the top insulation and the ballast units. The fabric must allow complete drainage (reference 3.03.C.4).
- D. All significant ponding at the membrane level must be corrected by improved drainage design as needed. Only sporadic minor “birdbathing” (less than 4 square feet, less than 1/2-in. deep) is acceptable.

3.05 Roof walkways

- A. Stevens concrete pavers are acceptable as walkways provided that traffic is light foot traffic restricted to maintenance people and not accessible to the public. Paver units are not designed to support heavy loads or intensive traffic. If regular traffic is anticipated, especially when accompanied by carts or other items that might point load paver units, substantial walkway pads should be installed over pavers on appropriate routes.

3.06 Height/Exposure limitations

- A. Height/exposure limitations vary with the deck type, ground roughness, building configuration, etc. Contact Stevens Technical Review Dept. for specific information on your project.

Table 2 - ASCE Exposure Classification






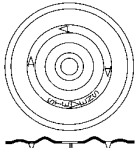

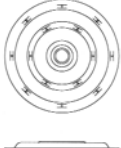
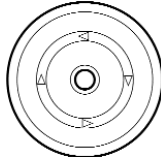
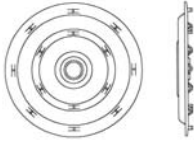
ASCE Exposure Classifications Defined

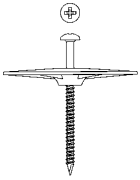
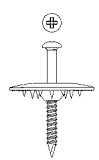
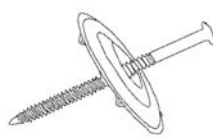
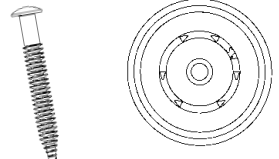



ASCE (American Society of Civil Engineers) has defined the roughness of the terrain into four “ground roughness” categories, or “exposures”.

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

				
<p>PRODUCT DESCRIPTION: Stevens #14 All-Purpose Fastener</p>	<p>PRODUCT DESCRIPTION: Stevens #12 Insulation Fastener</p>	<p>PRODUCT DESCRIPTION: Stevens Maxfast Fasteners</p>	<p>PRODUCT DESCRIPTION: Stevens Purlin Fasteners</p>	<p>PRODUCT DESCRIPTION: Stevens DeckGrip Fastener</p>
<p>All-purpose fastener for membrane and insulation attachment. Use with 2-inch (50-mm) BMSP or Hex Insulation Plate.</p>	<p>General purpose fastener for insulation attachment. Use with Hex Insulation Plate.</p>	<p>A large diameter head fastener for membrane attachment. Use with Maxfast Plate only.</p>	<p>A roofing fastener for membrane attachment to structural steel purlins in standing seam metal roof retrofit applications.</p>	<p>#15 fastener for membrane and insulation attachment. Used for Stevens EP and EV membrane</p>
<p>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).</p>	<p>SIZE AVAILABLE: 1⁵/₈, 2¼, 2⁷/₈, 3¼, 3¾, 4½, (41, 57, 73, 85, 95, 114-mm) 5 - 8-inch (125 - 200-mm) in 1-inch (25-mm) increments</p>	<p>SIZE AVAILABLE: 2 - 8-inch(50 - 200-mm) in 1-inch (25-mm) increments</p>	<p>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.</p>	<p>SIZE AVAILABLE: 1¼, 2, -8, 10, 12, 14 and 16-inch (30, 50 - 200, 250, 300, 355 and 406-mm)</p>
<p>DECK TYPE: Structural concrete (pre-drilling required), wood and 18 to 26 (1.3 - .55-mm) gauge steel.</p>	<p>DECK TYPE: Wood and 18 to 26 (1.3 - .55-mm) gauge steel</p>	<p>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].</p>	<p>DECK TYPE: 18-12 (1.3 - 2.5-mm) gauge steel</p>	<p>DECK TYPE: Structural concrete (pre-drilling required), wood and 18 to 26 (1.3 - .55-mm) gauge steel.</p>
<p>PACKAGING: 1¼ - 6-inch (30 - 150-mm): 1000/bucket 7, 8, 10, 12-inch (175, 200, 250, 300-mm): 500/bucket</p>	<p>PACKAGING 1⁵/₈ - 6-inch (41 - 150-mm): 1000/bucket 7 and 8-inch (175 and 200-mm): 500/bucket</p>	<p>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</p>	<p>PACKAGING: 500/box</p>	<p>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</p>
				
<p>PRODUCT DESCRIPTION: Stevens 2-in. (50 mm) Barbed Metal Seam Plates (for membrane attachment)</p>	<p>PRODUCT DESCRIPTION: Stevens Hex Insulation</p>	<p>PRODUCT DESCRIPTION: Stevens Maxfast Plate</p>	<p>PRODUCT DESCRIPTION: Stevens 2" Purlin Plate</p>	<p>PRODUCT DESCRIPTION: Stevens DeckGrip Plate</p>
<p>2-inch (50-mm) Galvalume® coated steel barbed seam plate for use with Stevens #14-10 fasteners or Stevens CD-10 concrete fasteners.</p> <p>SIZE AVAILABLE: 2-inch (50-mm) round barbed</p> <p>DECK TYPE: NA</p> <p>PACKAGING: 1,000/bucket</p>	<p>2⁷/₈-inch (73-mm) Hex-shaped Galvalume coated steel insulation plate for use with Stevens #12, #14 or Stevens CD-10 concrete fasteners.</p> <p>SIZE AVAILABLE: 2⁷/₈-inch (73-mm) diameter</p> <p>DECK TYPE: NA</p> <p>PACKAGING 1000/box</p>	<p>A 3-inch (76-mm) diameter plate for use only with the Stevens Maxfast Fastener for membrane attachment.</p> <p>SIZE AVAILABLE: 3-inch (76-mm) diameter</p> <p>DECK TYPE: NA</p> <p>PACKAGING: 500/bucket</p>	<p>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.**</p> <p>SIZE AVAILABLE: 2-inches (50-mm)</p> <p>DECK TYPE: NA</p> <p>PACKAGING: 1000/box</p>	<p>Galvalume steel seam plate featuring a unique patented "Eye Hook" design.</p> <p>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)</p> <p>SIZE AVAILABLE: 2 3/8-inch (60-mm)</p> <p>DECK TYPE: NA</p> <p>PACKAGING: 1000/bucket</p>

			
<p>PRODUCT DESCRIPTION: Stevens PIF (Preassembled insulation plate & fastener)</p> <p>Preassembled #12 (black) fastener with 3-inch (75-mm) (blue) locking plate for insulation attachment.</p> <p>SIZE AVAILABLE: 2¼, 2⅞, 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.</p> <p>DECK TYPE: Wood and 18 to 26 (1.3 -.55 -mm) gauge steel.</p> <p>PACKAGING 2¼ - 8-inch (57 - 200-mm): 250/box 10-inch (250-mm) and longer: 200/box</p>	<p>PRODUCT DESCRIPTION: Stevens ASAP (Preassembled membrane seam plate & fastener)</p> <p>All-purpose #14 fastener pre-assembled with 2-inch (50-mm) (gray) nylon locking plate for membrane attachment.</p> <p>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.</p> <p>DECK TYPE: Structural concrete (pre-drilling required), wood and 18 to 26 gauge (1.3 - .55-mm) steel.</p> <p>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</p>	<p>PRODUCT DESCRIPTION: Stevens Preassembled DeckGrip</p> <p>Preassembled membrane seam plate & fastener</p> <p>SIZE AVAILABLE: 2 - 8, 10, and 12-inch (50 - 200, 250 and 300-mm)</p> <p>DECK TYPE: Structural concrete (pre-drilling required), wood and 18 to 26 gauge (1.3 - .55-mm) steel.</p> <p>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</p>	<p>PRODUCT DESCRIPTION: Stevens SW Fastener and Plate Kits</p> <p>A "Superior Withdrawal" fastener for membrane attachment with 23/8-inch (60-mm) SW Barbed Metal Seam Plate.</p> <p>SIZE AVAILABLE: 2 - 8-inch(50 - 200-mm) in 1-inch (25-mm) increments</p> <p>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).</p> <p>PACKAGING: 2 - 8-inch (50 - 200-mm) 250 fasteners and plates/bucket</p>
			
<p>PRODUCT DESCRIPTION: Stevens CD-10 Concrete Fastener</p> <p>Non-threaded hammer-in (spike type) fastener for membrane and insulation attachment.</p> <p>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)</p> <p>DECK TYPE: Structural concrete</p> <p>PACKAGING: 2 - 8-inch (50 - 200-mm): 500/box 9-inch (228-mm) and longer: 250/box</p>	<p>PRODUCT DESCRIPTION: Stevens Masonry Anchor</p> <p>Hammer-in-type fastener for securing termination bar.</p> <p>SIZE AVAILABLE: 1/4-inch (6-mm) diameter x 1¼-inch (30-mm) length</p> <p>FOR USE IN: Concrete and masonry</p> <p>PACKAGING: 1,000/box</p>	<p>PRODUCT DESCRIPTION: Stevens Termination Bar</p> <p>Aluminum bar for use in membrane termination. Refer to specific SR details.</p> <p>SIZE AVAILABLE: 1-inch (25-mm) wide, 10-ft. (3-m) long 6-inch (150-mm) o/c slotted, punched</p> <p>DECK TYPE: N/A</p> <p>PACKAGING: 500-ft. (152-m)/tube 50 pcs,10-ft. (3-m) long</p>	



Appendix MA-B

(page 1 of 2)

STEVENS Approved Insulation List and Fastening Rates (Chart 5) for Mechanically Attached, Ballasted and VRS System Types

Introduction

This is a listing of insulation and cover board products acceptable for use with the Stevens Mechanically Attached Roofing System. 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. Please note the variations in required insulation pre-securement and/or cover board requirements as it relates to membrane color, insulation type and thickness.

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. Stevens recommends that the building dept. be consulted ensure compliance with local 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) Since many insulation systems provide taper to 1/2 inch thickness only, a tapered edging of Stevens approved insulation is recommended to be installed at all such transitions on Mechanically Attached, VRS (Vented Roofing System) and Ballasted Roofing Systems.
- 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) For Ballasted Systems (stone, paver), insulation boards shall be loose laid as outlined in the Stevens Guide Specifications. The insulation may be loose laid for VRS (Vented Roofing System) applications provided the boards are overlaid with a minimum 1/2 inch thick layer of moisture-resistant gypsum board.
- 8) 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.

STEVENS Approved Insulation List and Fastening Rates (Chart 5) for Mechanically Attached, Ballasted and VRS System Types

Insulation Type	Approved Manufacturers	Approved Product Name	Approved for Retrofit Applications	Approved for Stevens "Total System" Warranty	Insulation Pre-Securement for Mechanically Attached Systems		
					Stevens EV colors, EP colors or black EP	Stevens white EV, EP and Hypalon	
Expanded Polystyrene (EPS)	Insulfoam (Premier Industries)	Type VIII (1.25 pcf)	Yes (see note 1)	Yes	Overlayment Required (see note 2)	Overlayment Required (see note 3) 6 per 4'x 8' bd.	
		Type VIII (1.25 pcf) with "Secure-Ply" overlay					
		Type II (1.50 pcf)					
	Generic	R-TECH (fanfold) 1/2-in., Type VIII (1.25 pcf)	Recover Only (see note 1)	N/A	Overlayment Required (see note 3)	15 per 4'x 50' area	15 per 4'x 50' area
		Type VIII (1.25 pcf)	Yes (see note 1)			Overlayment Required (see note 3)	6 per 4'x 8' bd.
		Type II (1.50 pcf)					
Extruded Polystyrene	Dow Chemical Company	Styrofoam™	Yes (see note 1)	Yes	26 per 4'x 50' area	26 per 4'x 50' area	
		Recovermate™ CR (fanfold)	Recover Only (see note 1)				
		Recovermate™					
	Owens-Corning Building Products	Durapink®	Yes (see note 1)		8 per 4'x 8' bd. (see note 6)	6 per 4'x 8' bd.	
		Foamular® 250, 404					
	Paciv Building Products	PB-6® (fanfold)	Recover Only (see note 1)		26 per 4'x 50' area	26 per 4'x 50' area	
Gypsum Board	Georgia-Pacific Corp.	1/4" Dens-Deck®	(see note 4)	Yes	5 per 4'x 8' bd.	5 per 4'x 8' bd.	
		1/2" Dens-Deck®	Yes				
	Generic	Moisture Resistant	N/A	Yes	Overlayment Required for Mech. Attached systems (see note 5). Approved for VRS applications.		
	USG	1/4" Securock®	(see note 4)		5 per 4'x 8' bd.	5 per 4'x 8' bd.	
		1/2" Securock®	Yes				
Perlite	Generic	Various	N/A	N/A	Overlayment Required (see note 5)		
Polyisocyanurate	STEVENS Roofing Systems	Iso 2000	Yes	Yes (see "Warranty Fee Table" for applicable fee discounts)	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
		Iso 2000 Tapered					
		Iso 3000					
		Recover Board					Yes (recover only)
	Atlas Roofing Corporation	AC Foam II®, AC Foam III®	Yes	Yes	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
		Recover Board®	Yes (recover only)				
	Dow Chemical Company	Hy-Therm AP®	Yes	Yes	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
		Hy-Therm Composite®					
	Dyplast Products, LLC	dpFOAM II, III™	Yes	N/A	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
	Firestone Building Products	ISO 95+®, ISO 300					
	Hunter Panels, LLC	H-Shield					
Johns Manville Corp.	ENRGY™ 3						
	JM ISO I®						
Rmax, Inc.	Multi-Max® FA	Yes (recover only)	Yes	6 per 4'x 8' bd.	6 per 4'x 8' bd.		
	Recover Board						
Wood Fiberboard	Georgia-Pacific Corp.	High Density Roof Fiberboard	Yes	N/A	6 per 4'x 8' bd. 4 per 4'x4' bd.	6 per 4'x 8' bd. 4 per 4'x4' bd.	
	IKO	Armourdeck					
	Knight-Celotex	Structodek™					
	Temple Inland	HD-1, HD-6					

Notes:

- A separation sheet/layer may be required when using a polystyrene product directly over coal tar pitch B.U.R. or PVC-based roof systems. Consult the insulation manufacturer for specific requirements.
- Stevens requires this product to be overlaid with an approved polyisocyanurate, wood fiberboard, or Dens-Deck™ insulation/cover board when using with black or colored Stevens Membrane.
- Due to the lower compressive strength of Type II (1.25 pcf nominal density) expanded polystyrene (EPS), Stevens requires this product to be overlaid with an approved polyisocyanurate, wood fiberboard, or Dens-Deck™ insulation/cover board for Mechanically Attached, Fully Adhered and some VRS Roofing Systems. Type I (1.0 pcf nominal density) EPS is acceptable for use under ballasted systems only.
- 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.
- Stevens considers this product a "barrier board", used as an underlayment in insulation assemblies to meet specific fire ratings. Stevens requires barrier boards to be overlaid with an approved insulation or cover board.
- Dow "Recovermate™" and Owens-Corning "Durapink®" products may have additional installation requirements/restrictions when used directly under black or dark colored membrane. Consult the product manufacturer and/or the Stevens Technical Department for specific requirements.