FleeceBACK® Roofing Systems

G U I D E - S P E C

Plaza Paver Waterproofing System

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This **GUIDE-SPEC** provides a brief outline of Carlisle's Plaza Waterproofing System which consists of a primary waterproofing membrane utilizing FleeceBACK EPDM 145-mil membrane or FleeceBACK AFX EPDM 105-mil membrane in conjunction with a modified base sheet and Hanover Concrete Pavers and pedestals (available through Carlisle) as a top-surfacing material. While the GUIDE-SPEC contains specifics pertaining to various methods of membrane installation, contractors may reference other Carlisle technical publications for in-depth application procedures.

PART I GENERAL

1.01 DESCRIPTION

The Carlisle Plaza Waterproofing System consists of either 145-mil FleeceBACK EPDM membrane adhered with Flexible FAST Adhesive or 105-mil FleeceBACK AFX EPDM membrane and Carlisle modified base sheet adhered with Cold-Applied Adhesive, SEBS-modified asphalt, or Type III or IV asphalt. The membrane and/or base sheet is adhered directly to the structural concrete deck and adjacent EPDM membranes are spliced together with 6" wide Factory Applied Tape and overlaid with 6" wide Pressure-Sensitive Flashing. End-laps shall be overlaid with 6" and 12" wide Pressure-Sensitive Flashing.

Depending upon deck slope, the membrane assembly may be overlaid with MiraDRAIN 9800 Drainage Board or directly covered with EPS Insulation (drainage channels required for bottom layer).

The appropriate plaza paver may be installed in conjunction with a pedestal system over a layer of drainage board or HP Protective Mat.

The Carlisle FleeceBACK and FleeceBACK AFX published specification can be referenced for specific installation procedures or waterproofing product information. The various paver/pedestal systems available from Carlisle are included as part of this document. Additional information is available on the applicable Product Data Sheet and can be accessed on the Carlisle website.

1.02 DESIGN CONSIDERATIONS

A. The use of Hanover Prest pavers (2' x 2' x 2" thick) is limited to projects with building heights not greater than 75' regardless of the wind zone.

B. Projects with building heights up to 100' may incorporate the use of Hanover Guardian pavers (2' x 2 'x 2" thick) weighing approximately 25 psf or the 2' x 2' x 3" thick Guardian paver weighing 38 psf.

C. Projects greater than 100' in height up to 160' in height must incorporate the use of the Guardian 3" thick paver. All other projects must be submitted for Carlisle's review.

D. In addition to the approved flashing details, a protection layer must be used to protect flashing from possible rubbing action by the pavers.

E. When assessing wind impact along the perimeter, a paver hold-down method may be incorporated in conjunction with wall flashing details to secure paver during high wind storms and protect flashing against abrasive action. When necessary, Carlisle may be consulted for recommendations.

F. Positive drainage shall be provided to ensure proper drainage within 48 hours. When the plaza area contains a vegetated roof or planters, adequate separation (without interfering with drainage) must be provided. Carlisle may be consulted for recommendations on the use of certain products.

G. Consult Product Data Sheets for different Carlisle components and their weight per square foot to ensure structural load limitations are not exceeded.

1.03 QUALITY ASSURANCE

A. This Plaza Waterproofing System must be installed by a Carlisle Authorized Roofing Applicator in compliance with shop drawings as approved by Carlisle. There must be no deviations made from Carlisle's specifications or the approved shop drawings without the **PRIOR APPROVAL** of Carlisle.

B. A **pre-installation meeting** should be coordinated by the specifier and attended by the Carlisle authorized applicator, Carlisle representative, and other trades accessing the waterproofing system to discuss the necessity of ensuring proper membrane protection during all phases of installation and to review other applicable requirements or unusual field conditions.

C. Upon request by the Authorized Applicator, an inspection will be conducted by a Field Service Representative of Carlisle to ascertain that the membrane system has been installed according to Carlisle's specifications and details. This **inspection** shall be coordinated **prior to installing the "above membrane components"** so access to the membrane is not impaired. Refer to Paragraph 3.04.F.2.

D. Flood testing, electronic testing or other leak detection means are **required** to ensure that the waterproof integrity of the membrane is intact prior to installing any above membrane components.

1.04 SUBMITTALS

A. To ensure compliance with Carlisle's warranty requirements, all projects including the following should be forwarded to Carlisle for review prior to installation, preferably prior to bid.

1. Projects where the FleeceBACK Membrane is expected to come in direct contact with petroleum based products or other chemicals.

2. Projects where the specified warranty length coverage is greater than a 15-year Total System Warranty.

3. Projects where extended wind speed coverage greater than 72 mph is specified.

4. Projects where building heights are greater than 160 feet and those located in wind zones greater than 130 mph.

B. For all projects, prior to project inspection by Carlisle, a final shop drawing must be approved by Carlisle and a leak detection test must be performed as outlined above.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in the original, unopened containers labeled with the manufacturer's name, brand name and installation instructions.

B. Job site storage temperatures in excess of 90°F may affect shelf life of curable materials (i.e., Flexible FAST Adhesive – Part A and B, bonding adhesive, sealants, cleaners, primers, SecurTAPE, Pourable Sealer, Pressure-Sensitive Flashing and uncured flashing).

C. When liquid adhesives and sealants are exposed to lower temperatures, restore to a minimum of 60°F before use. Do not store containers with opened lids due to loss of solvent that will occur from flash off.

D. FleeceBACK membrane should be stored in its original plastic wrap and be covered to protect from moisture. Any moisture absorbed by the fleece-backing must be removed by using a wet-vac system, prior to membrane adhesion.

E. Insulation and underlayment must be stored so they are kept dry and protected from the elements. Store insulation on a skid and completely cover with a breathable material such as tarp or canvas. If the insulation is lightweight, it should be weighted to prevent possible wind damage.

1.06 JOB CONDITIONS

A. Do not apply Carlisle Flexible FAST Adhesive when surface and/or ambient temperatures are below 25°F when using heated spray or extrusion equipment.

B. Flexible FAST Adhesive is not compatible with fresh asphalt products. When fresh asphalt products are expected, FleeceBACK AFX membrane may be adhered to the substrate with cold-applied adhesive or hot-steep asphalt.

C. Coordination between various trades is essential to avoid unnecessary traffic over sections of the installed membrane to prevent damage to the membrane.

1.07 WARRANTY

All Carlisle warranties on commercial projects are available for a charge when all components manufactured or marketed by Carlisle are utilized.

Two warranties are available from Carlisle; a waterproofing warranty covering the waterproofing membrane and accessories, and an optional Paver System Warranty.

A. **A 10, 15 or 20 year Total System Warranty** with peak gust wind speed coverage of up to 55 mph covering the waterproofing membrane system. The wind speed coverage can be extended to 80 mph when Flexible FAST adhesive is used.

B. **Plaza Paver System Warranty (optional)** –

1. This optional warranty is available for 10, 15 or 20 year, covering the removal of the overburden (Carlisle provided components above the waterproofing membrane).

2. Optional material warranty is available for a period of 10 years, which warrants that the pavers will not crack, split or otherwise deteriorate to the point of breakage due to freeze-thaw action.

3. Optional insulation warranty is available for a period of 10 years, which warrants that the insulation will retain 80% of its thermal value for the warranty period of 10 years.

PART II PRODUCTS

2.01 GENERAL

The components of this waterproofing system are to be products of Carlisle or accepted by Carlisle as compatible. The installation, performance or integrity of products by others, **when selected by the specifier and accepted as compatible by Carlisle,** is not the responsibility of Carlisle and is expressly disclaimed by the Carlisle Warranty.

2.02 MEMBRANE

A. **FleeceBACK EPDM Membrane** incorporates 90-mil thick Sure-Seal non-reinforced EPDM membrane laminated to 55-mil thick non-woven polyester fleece-backing resulting in a total finished sheet thickness of 145 mils. The membrane is available in 10’ wide by 50’ or 100’ long rolls with 6” Factory Applied Tape (FAT).

B. **FleeceBACK AFX EPDM Membrane** incorporates 60 mil thick non-reinforced EPDM membrane l**a**minated to a 7.5 ounce per square yard, non-woven polyester propylene blended fleece backing resulting in a total thickness of approximately 105-mils. This membrane is available in 10’ wide by 100’ long and 4.5’ wide by 50’ long with 6” Factory Applied Tape (FAT).

2.03 RELATED MATERIALS

A. **SureMB 90 Base Ply** (required in conjunction with AFX Membrane) **–** 90-mil Glass fiber, reinforced, SBS-modified asphalt, base sheet that meets ASTM D 6163 Type I, Grade S for SBS-modified bituminous sheet materials. Available in 39-3/8" wide and 49’-1” long (161 square feet) weighing 0.58 lbs per square foot.

B. **Carlisle’s Cold-Applied Adhesive** (required in conjunction with AFX Membrane) - An asphalt-modified polyether VOC-free adhesive. This product is a one-sided, wet lay-in adhesive for use with Sure-Seal FleeceBACK AFX Membranes. Coverage rate is 1.5 gallons per square or 67 square feet (62 sq. m) (26 mils) per gallon for smooth surfaces and 50 square feet (4.6 sq. m) (32 mils) for uneven or semi-absorbent surfaces. Coverage rates are average and may vary due to conditions such as insulation type, surface, air temperature, and equipment (spreader) or type of squeegee.

C. **Insulfoam XIV** is a minimum 40 psi compressive strength**,** moisture resistant, closed cell expanded polystyrene with 1/4” x 1/4” drainage channels every 2” o.c. Used directly above the membrane as insulation material and to facilitate drainage. Available in 4’x 4’and 4’ x 8’ board sizes with a thickness of 1" to 40”. Readily available in custom lengths and widths.

D. **Dow Roofmate or Foamular 404/604** is a minimum 40/60 psi compressive strength, moisture resistant, closed cell polystyrene

foam insulation with drainage channels along board edges to promote drainage at the membrane level. Used as an above-membrane insulation in conjunction with appropriate drainage/protection fabric. Available in 2' x 8' board sizes with a thickness of 1" to 4".

E. **CCW 200V Protection Fabric -** A 12 oz/yd^2 polypropylene non-woven needle-punched fabric used as a protection sheet directly over the waterproofing membrane or beneath the MiraDRAIN 9800 Drainage Board. Stabilized to resist soil chemicals, mildew, insects, and is non-biodegradable. Available in rolls 12.5'in width by 200' in length.

F. **MiraDRAIN 9800 Drainage Board -** is a high-performance, high-strength drainage composite consisting of a three-dimensional high-impact polystyrene core, and a superior, heavy-weight nonwoven filter fabric. The filter fabric is bonded to the individual dimples of the molded polystyrene core to minimize fabric intrusion into the flow channels caused by backfill pressure. Used in conjunction with CCW 200V Protection Fabric to facilitate drainage above waterproofing membrane. Typically, the MiraDRAIN 9800 Drainage Board is installed beneath EPS insulation.

G. **Other Products:**:

Flexible FAST Adhesive (used with FleeceBACK EPDM membrane); Bonding Adhesive, Lap Sealant, Primer, SecurTAPE, Pressure Sensitive Cured Cover Strip, Pressure-Sensitive Elastoform Flashing®, Termination Bars, Carlisle Insulation, Insulation Fasteners, Water Cut-Off Mastic, LIQUISEAL Liquid Flashing, Universal Single Ply Sealant and Pourable Sealer are required for use with this roofing system. HP Protective Mat, Pressure-Sensitive Inside/Outside Corners, Pipe Flashings and Pourable Sealer Pockets.

2.04 Architectural Pavers

A. **Hanover Architectural Products (available through Carlisle)**

1. **Hanover Prest Pavers** – 23-1/2" x 23-1/2" x 2" thick precast concrete pavers weighing 25 psf with a compressive strength of 8500 psi. Absorption is less than 5% and flexural is 1,100 psi. For use in typical plaza applications for pedestrian traffic. Additional standard and custom-made sizes available including eight standard colors Quarry Red, Charcoal, Natural, Red, Tan, Brown, Cream, and Limestone Gray. Custom color and aggregate blending are available.
2. **Hanover Guardian Paver** - This plaza paver is developed for high wind and special aesthetic effect. The paver is 23-1/2" x 23-1/2"x 2" or 3" thick and weighs 25 psf to 38 psf. The Guardian Paver has a square top that allows its bolt to pass through to the base beneath, fitting into a recessed grooved portion of the Guardian Paver. The paver is specifically shaped to solidly secure into the pedestal base. Eight standard colors are available; Quarry Red, Charcoal, Natural, Red, Tan, Brown, Cream, and Limestone Gray. Custom color and aggregate blending are available.
3. **Hanover Pedestal Paver** – Used for light traffic areas associated with rooftop or garden roof applications. 23-1/2" x 23-1/2" x 2-1/4" thick precast concrete pavers weighing 22 psf with an elevated clearance of 1/2" from incorporated footing.

Note: Hanover Prest Pavers, Guardian Pavers, and Pedestal Pavers are available in Tudor and Diamond finishes.

B. Accessories

1. **Pedestals/Shims** – Different types of pedestals and shims can be used to facilitate drainage, elevate the paver system or provide a leveled surface.
   a. **High-Tab Pedestal and Flexible Leveling Shims** – A 7" octagon-shaped pedestal available in 3/8" thickness with 1/8" spacers. The pedestal is stackable and can be used with flexible leveling shims which are available in 1/8" (white) or 1/16" (black). The leveling shims may be separated into halves or quarters for individual paver adjustments.
   b. **EPDM Pedestal and Leveling Shims** – A 3/8" fixed height EPDM rubber pedestal incorporating 1/8" spacer tabs. The pedestal allows pavers to follow the contour of the roof and may be combined with 1/8" or 1/16" leveling shims to prevent paver movement and provide a more stable feel.
   c. **Elevator Pedestal System** – The Elevator Pedestal System can be used in applications where the paver system needs to be elevated above 2" and up to 16". The system consists of 3 basic components; a round pedestal base (available in heights of 2", 3", and 4") and a top section with a threaded shaft (in heights of 2", 3", and 4"). A coupler is used to connect the base to the top section when an elevation greater than 7 3-4" is needed (one or two couplers may be used). All components are interchangeable to achieve the desired elevation. Elevations greater than 16" require special bracing.
   d. **Compensator Leveling System** – The Compensator is specially designed with a tapered circular base made of high-density plastic to allow installers to easily achieve a leveled surface. One or more Compensators can be stacked to achieve the desired elevation. In addition to stacking, the Compensator can be combined with either the High-Tab Pedestal or the Elevator Pedestal.
2. **Hanover RockCurb** - Transition component between paver system and adjoining optional roof garden assembly.
   a. **RockCurb Straight Sections** – 6" wide x 36" long, available in heights of 8", 12", and 18" and weighing 158 lbs (72 kg), 197 lbs (89kg), and 350 lbs (159 kg), respectively. The 18" RockCurb Straight Section is available in both Battered

and rounded Bullnose Profiles, while the 12” is only available in Battered Profile. The 8” section is only available in a straight edge profile.

b. **RockCurb Radius Sections** - 6” wide and available in heights of 12” and 18” with a limited number of external radii. The 18” Rock Curb Radius Section is available in both Battered and rounded Bullnose Profiles, while the 12” is available only in Battered Profile. Carlisle may be contacted for specially designed configurations.

PART III EXECUTION

3.01 GENERAL

When feasible, begin the application at the highest point and work to the lowest point to prevent moisture infiltration and minimize construction traffic on completed sections. This will include completion of all flashings and terminations.

3.02 ROOF DECK CRITERIA

A. A proper substrate shall be provided by the building owner. The structure shall be sufficient to withstand normal construction loads and live loads.

B. Defects in the plaza deck must be reported and documented to the specifier, general contractor and building owner for assessment using the Pre-Installation Substrate Inspection Report. The Carlisle Authorized Applicator shall not proceed unless the defects are corrected.

3.03 SUBSTRATE PREPARATION

A. The substrate must be dry, relatively smooth, and free of protrusions, debris, sharp edges or foreign materials and must be free of accumulated water, ice, and snow. Cracks or voids in the substrate greater than ¼" (6 mm) must be filled with a suitable material.

B. Priming of the structural deck using Cut-Back Asphalt Primer is required when hot asphalt is used to adhere the membrane and base sheet.

3.04 INSTALLATION

Refer to the applicable Material Safety Data Sheets and Product Data Sheets for cautions and warnings.

A. When FleeceBACK EPDM is specified, refer to Carlisle FleeceBACK published specification and details.

B. When FleeceBACK EPDM is to be used, the membrane may be adhered with the spray or extruded method directly over structural concrete plaza decks (new or tear-off).

C. When FleeceBACK AFX EPDM membrane is specified, refer to Carlisle FleeceBACK AFX Roofing System published specifications and details.

D. When FleeceBACK AFX EPDM is specified, the membrane is adhered with Cold-Applied Adhesive in conjunction with Carlisle Modified Base Sheet directly to the structural deck. Modified SEBS asphalt or Type III or IV asphalt may be substituted for the Cold-Applied Adhesive when specified.

1. With FleeceBACK EPDM or FleeceBACK AFX EPDM, all field splices must be overlaid with Pressure-Sensitive Flashing as described in Article 1.01 of Part I.

E. **Metal Work**

1. Terminate the flashing in accordance with the appropriate Carlisle Termination Details.

F. **Prior to Paver Installation**

1. Ensure that all membrane splices have been overlaid, all membrane flashing has been installed, and that all membrane terminations have been completed prior to installation of pavers or pedestals.

2. Prior to paver installation, ensure an inspection of the completed Plaza Waterproofing System is conducted by a Field Service Representative of Carlisle. A final inspection of the completed paver system should be coordinated with Carlisle to take place upon project completion if the optional “Plaza Paver System Warranty” is requested from Carlisle.

G. **Protection Fabric/Drainage Board Placement**

1. Clear membrane surface of all debris, tools and foreign material prior to placement of the CCW 200V Protection Fabric or the Insulfoam XIV.

2. Insulfoam XIV (with drainage channels every 2") can be directly installed over sloped structural deck. When positive drainage is not facilitated by tapering the deck, MiraDRAIN 9800 Drainage Board is required and must be installed in conjunction with the CCW 200V Protection Fabric.

3. Install Protection Fabric with adjacent sheets overlapping approximately 6" and the end-laps approximately 12". The drainage board must be installed as per Product Data Sheet.

4. Insulation Placement

    a. Install insulation directly over the membrane (Insulfoam XIV only) or over the MiraDRAIN 9800 Drainage Board. When the Insulfoam is to be installed directly on the membrane, position so that all drainage channels are down-facing and down-slope to facilitate drainage.

    b. Stagger insulation joints between layers and cover the top layer with a layer of either HP Protective Mat or CCW 200V Protection Fabric.

5. Pedestal/Paver Installation

    a. Select appropriate Pedestal System to suit the job condition and the desired elevation. More than one system can be combined to meet parameters set forth by the specifier.

    b. When installing Guardian Paver System do not over-tighten screws securing the top plate to the base. All fasteners should be installed to a snug position.

    c. Position appropriate Pedestals at all Paver intersection points. Use shims where necessary to level the paver surface and provide stability to the Plaza Pavers.

    d. Provide a reasonable gap between the first row of pavers and wall flashing to eliminate the possibility of flashing puncture that may result from movement of pavers.

    e. When necessary, a protection layer may be incorporated to protect wall flashing and to offer a finished surface to complement the Plaza design.