Sure-Seal®/Sure-White® Roofing Systems
"Attachment III"

20-Year Warranty - Design Enhancements

August 2007

Information contained in this Attachment outlines necessary enhancements required for projects where a 20-year Total System Warranty is specified. At the applicator's or specifier's discretion, projects may be forwarded to Carlisle for evaluation prior to installation or bid.

A. Design Criteria

1. On Mechanically Fastened Roofing Systems, a minimum of 60-mil thick Sure-Tough reinforced membrane is required. On Adhered Roofing Systems, minimum 60-mil thick Sure-Seal/Sure-White non-reinforced or Sure-Tough reinforced EPDM Membrane may be specified. On Ballasted assemblies, minimum 60-mil Sure-Seal non-reinforced or 75-mil Sure-Tough reinforced EPDM Membrane is required.

   All "T" joints must be overlaid with Pressure-Sensitive Uncured Elastoform Flashing.

2. For Mechanically Fastened or Ballasted Roofing Systems, building height shall not exceed 50'. Adhered applications are limited to a building height of 100'. Projects with a building height greater than listed may be submitted for Carlisle's review.

3. A minimum slope of 1/4" per horizontal foot preferred; however, 1/8" slope with sufficient number of drains and crickets/saddles may be accepted.

4. All products specified for this roofing assembly must be products manufactured or marketed by Carlisle.

5. On recover projects where the existing roofing material is to be left in place, all wet roofing material must be totally removed. A thorough roof investigation utilizing moisture scanning devices is strongly recommended.

6. Shop drawings must include all pertaining details.

B. Acceptable Deck Types - Refer to "Attachment I" for minimum pullout criteria.

1. Steel (22 gauge or heavier)
2. Structural Concrete (minimum 3,000 psi)
3. Plywood (minimum 15/32" thick)
4. Wood Planks (minimum 1-1/2" thick)
5. Fibrous Cement and Gypsum (Adhered Roofing Systems only with maximum warranty wind speed of 72 mph)

C. Mechanically Fastened Assemblies (maximum 50' in height) – Sure-Tough Reinforced Membrane Only

1. **Acceptable Insulation/Underlayment**

   a. Carlisle Polyisocyanurate (standard compressive strength).

   b. HP Recovery Board or Dens-Deck/Dens-Deck Prime **over any Carlisle insulation**.

      Note: HP Recovery Board or Dens-Deck may only be use on top of Carlisle insulation. Their direct use over any existing roofing membrane or roof deck is not permitted.

   c. Carlisle FR Base Sheet may be approved to meet certain fire codes over combustible roof decks.

   d. **Insulation Securement** - HP Recovery Board, Dens-Deck/Dens-Deck Prime or Polyisocyanurate Insulation fastened with 6 fasteners/plates per 4' x 8' board (1 per 5.3 square feet). When 4' x 4' boards are used 4 fasteners/plates are required (1 per 4 square feet).

2. **Membrane Fastening Requirements**

a. On steel and wood decks, HP Fasteners/Polymer Plates, HP-X Fasteners/Polymer Batten Bars or Sure-Tite Fasteners/ST Fastening Bars must be used. Assemblies where the fastener length is expected to exceed 6" in length, must be submitted to Carlisle to determine a suitable fastening density.

b. On structural concrete decks, CD-10 or HD 14-10 Fasteners shall be used with Polymer Plates.

c. **Field Membrane Securement:**

1) On steel or wood plank decks, 8' wide field sheets shall be fastened 12" o.c. or 10' wide field sheets fastened 6" o.c. with HP Fasteners/Polymer Plates or HP-X Fasteners/Polymer Batten Bar.

2) As an option on steel decks, 10' wide field sheets can be fastened 12" o.c. with Sure-Tite Fasteners and ST Fastening Bars.

3) On 15/32" plywood decks, 8' wide field sheets shall be fastened 9" o.c with HP Fasteners/Polymer Plates.

4) On structural concrete decks, 10' wide field sheets shall be fastened 12" o.c. with CD-10 or HD 14-10 Fasteners with Polymer Plates.

d. **Perimeter Membrane Securement:**

4-1/2' wide perimeter sheets or 9" wide Pressure-Sensitive RUSS positioned beneath field sheets (3-1/2' – 5' on center) are used for perimeter securement.

1) **Two perimeter sheets** required for **55 mph peak gust wind speed** coverage.

2) **Three perimeter sheets** required for **72 mph peak gust wind speed** coverage.

3) On **steel decks**, 22 gauge or heavier, or **minimum 1" thick wood planks**, **four perimeter sheets** are required for projects with a **wind speed coverage of 90 mph** peak gusts when a **minimum 1/2" thick Dens-Deck** is used as the membrane underlayment.

Note: On minimum 15/32" plywood decks, the same membrane assembly utilizing four perimeter sheets will qualify the project for a peak gust wind speed coverage of 80 mph.

3. **Splice Requirements**

a. For minimum 1/4" in 12" roof slopes with splices shingled, 6" wide SecurTAPE™ or 6" Factory-Applied TAPE (FAT) is used for all splices.

b. For slopes less than 1/4" in 12" or when splices buck water at fastener locations, 3" wide SecurTAPE is used behind fastening plates and 6" wide SecurTAPE is used in front of fastening plates. As an option, 6" wide SecurTAPE can be used when splices are overlaid with 6" wide Pressure-Sensitive Cured Cover Strip.

c. 6" wide SecurTAPE shall be used at all end laps and at base flashing splices at curbs, skylights, parapets (when RUSS is not used).

D. Adhered Roofing Assemblies (maximum 100' in height) – Sure-Seal, Sure-White or Sure-Tough Membranes

1. **Acceptable Insulation/Underlayment**

a. Minimum 1-1/2" Carlisle Polyisocyanurate (standard compressive strength). Minimum 1" thickness acceptable for use on reroofing projects.

b. HP Recovery Board or Dens-Deck Prime over any Carlisle Insulation

Note: HP Recovery Board or Dens-Deck Prime may only be use on top of Carlisle insulation. Their direct use over any existing roofing membrane or roof deck is not permitted.

c. Minimum 7/16" OSB over any Carlisle Insulation or OSB/Polyiso Composite.

2. **Warranty Wind Speed (Maximum Peak Gusts)**

Wind speed coverage available will vary depending on deck type, fastening density and the type of membrane underlayment utilized. Paragraph D.3 of this Attachment should be referenced to determine the approved fastening pattern for the desired assembly.

Note: Projects with cementitious wood fiber or gypsum decks are limited to a maximum wind speed coverage of 72 mph regardless of the membrane underlayment utilized.

a. **55 mph** – Adhered to standard Carlisle Polyisocyanurate

b. **72 mph** – Adhered to 25 psi Carlisle Polyisocyanurate

c. **80 mph** – Adhered to HP Recovery Board or 1/4" thick Dens-Deck Prime (installed over approved Carlisle Insulation).

d. **90 mph** – Adhered to 1/2" Dens-Deck Prime (installed over approved Carlisle Insulation).

e. **100 mph** – Adhered to 7/16" OSB or 5/8" thick Dens-Deck Prime (installed over approved Carlisle Insulation).

f. **120 mph** – Adhered to 7/16" OSB or 5/8" thick Dens-Deck Prime (installed over approved Carlisle Insulation).

3. **Insulation/Underlayment Attachment**

Outlined below are different fastening patterns for insulations and underlayments suitable for the various wind speed coverages available. In addition to mechanical securement, FAST Adhesive may be used to attach all insulation listed in this attachment to the structural deck. When OSB is used as a separate membrane underlayment, it must be mechanically fastened (refer to Paragraph C.3.i below for other options).

a. **Minimum 2" thick Carlisle Polyisocyanurate** shall be fastened 1 per 4 square feet (8 fasteners per 4' x 8' board) except on fibrous cement and gypsum decks where a heavier fastening density of 1 fastener per 2 square feet is required.

b. **Minimum 1-1/2" thick Carlisle Polyisocyanurate** shall be fastened 1 per 2.9 square feet (11 fasteners per 4' x 8' board) except on fibrous cement and gypsum decks where a heavier density of 1 fastener per 2 square feet is required.

c. **Carlisle Polyisocyanurate less than 1-1/2" thick** (reroofing projects) shall be fastened 1 per 2 square feet.

d. **1/2" thick HP Recovery Board** shall be fastened 1 per 2 square feet.

e. **1/4" thick Dens-Deck Prime** shall be fastened a minimum of 12 fasteners/plates per 4' x 8' board. Fastening density shall be increase by 50% in the perimeter area (minimum 12') in order to achieve a maximum peak gust wind speed coverage on the warranty of **80 mph**.

f. **1/2" thick Dens-Deck Prime** shall be fastened a minimum of 12 fasteners/plates per 4' x 8' board. Fastening density shall be increased by 50% in the perimeter area (minimum 12') in order to achieve a maximum peak gust wind speed coverage on the warranty of **90 mph.**

g. **5/8" thick Dens-Deck Prime** shall be fastened at a rate of 1 fastener/plate per 2 square feet to achieve a maximum **peak gust wind speed** coverage on the warranty of **100 mph**.

h. **5/8" thick Dens-Deck Prime** shall be fastened a minimum of 24 fasteners/plates per 4' x 8' board. Fastening density shall be increase by 50% in the perimeter area (minimum 12') in order to achieve a maximum **peak gust wind speed** coverage on the warranty of **120 mph.**

i. **7/16" OSB Board** shall be fastened at a minimum of **17 fasteners**/plates per 4' x 8' board to achieve a maximum **peak gust wind speed of 100 mph**. A fastening density of **17 fasteners**/plates per 4' x 8' board plus **50% increase** in fastening in the **perimeter area** (minimum 12' wide) will qualify the project for a maximum **peak gust wind speed of 120 mph**.

Note: Use of FAST Adhesive to attach OSB to other Carlisle insulation is not recommended. OSB/Polyiso Composite Board may be specified and can be attached with either FAST Adhesive or mechanical fasteners.

4. **Splice Requirements**

a. Projects with roof slopes 1/4" per horizontal foot or greater may incorporate 3" wide Factory-Applied TAPE (FAT) for membrane splicing as long finished splices are shingled.

b. For slopes less than 1/4" in 12", splices must be completed with 6" wide SecurTAPE.

Notes: Field splices located in areas where ponding water occurs or those that resist water flow, must be overlaid with 6" Pressure-Sensitive Cured Cover Strip.

All field splice intersections must be overlaid with a Pressure-Sensitive "T" Joint Cover or 6" wide Pressure-Sensitive Elastoform Flashing.

c. Above splice requirements are also applicable at base flashing splices at curbs, skylights, parapets (when RUSS is not used).

E. Ballasted Roofing Assemblies (maximum 50' in height) – Sure-Seal or Sure-Tough Membranes

1. **Acceptable Insulation/Underlayment**

a. Minimum 1" thick Polyisocyanurate, EPS, Extruded Polystyrene or 1/2" thick HP Recovery Board (Recovery Board not permitted to be installed directly over existing roofing material).

b. Insulation must be loose-laid over an approved substrate. Mechanical attachment of insulation is not permitted.

Note: Carlisle urethane based insulation adhesive can be used for insulation attachment if desired.

2. **Ballast Requirements**

a. **Building height up to 25'** – 2-1/2" nominal diameter stone (ASTM D448, gradation size #2) at 13 pounds per square foot for 10' wide perimeter. The field of the roof shall be ballasted at the rate of 10 pounds per square foot using 1-1/2" nominal diameter stone (ASTM D448, gradation side #4).

b. **Building height up to 26' – 50'** – 2-1/2" nominal diameter stone (ASTM D448, gradation size #2) at 13 pounds per square foot for 20' corners and 10' wide perimeter. The field of the roof shall be ballasted at the rate of 10 pounds per square foot using 1-1/2" nominal diameter stone (ASTM D448, gradation size #4).

c. If pavers are specified, they must be 2' x 2' x 2", weigh a minimum of 22 pounds per square foot and must be elevated on rubber or plastic pedestals or 4" x 4" sections of Carlisle Walkway Pads. Paver and pedestal type must be submitted to Carlisle for approval.

The above ballast requirements will qualify for a warranty wind speed coverage of 55 mph peak gusts. Wind speed coverage up to 72 mph is also available with additional enhancements that will be determined during Carlisle's review of the project.

3. **Splice Requirements**

a. 6" wide SecurTAPE™ or 6" wide Factory-Applied TAPE (FAT) (surface primed with HP-250 Primer) shall be used and all field splice intersections (T-Joints) must be overlaid with Pressure-Sensitive "T" Joint Covers or 6" wide Pressure-Sensitive uncured Elastoform Flashing.

b. As an option, 3" wide minimum splice (surface primed with HP-250 Primer prior to using adhesive or tape) overlaid with 6" wide Pressure-Sensitive Uncured Elastoform Flashing. Membrane primed prior to overlayment with flashing.

c. Above splice requirements are also applicable at base flashing splices at curbs, skylights, parapets (when Pressure-Sensitive RUSS is not used).

F. Metal Accessories (for Adhered, Mechanically Fastened or Ballasted Assemblies)

1. For Adhered or Mechanically Fastened Roofing System projects with a warranty wind speed coverage of 90 mph or greater, Carlisle SecurEdge™ 2000 or 3000 Metal Fascia must be used.

2. For projects with a warranty wind speed less than 90 mph, Carlisle SecurEdge, SecurEdge 1000, or SecurEdge 200 may be used. Along gutters, the Carlisle Termination Bar may be used.

   Notes: In lieu of ring shank nails staggered at 4" on center, HP or HP-X Fasteners may be used at 12" on center to secure the SecurEdge Metal Fascia.

   When snap-on edge metal fascia (SecurEdge or SecurEdge 200) is specified for a warranty **wind speed coverage of 80 mph**, the use of Pressure-Sensitive RUSS at the base of the metal dam is required for Adhered and Ballasted Roofing Systems. The use of Pressure-Sensitive RUSS is required on all Mechanically Fastened Roofing Systems, regardless of warranty wind speed coverage. Refer to Carlisle Detail MFS-1-F for specific requirements.

   For Adhered and Ballasted Assemblies where **maximum 72 mph coverage** is required, Pressure-Sensitive RUSS must be installed 10' from each corner. Refer to Carlisle Detail A-1-F (10' from corners in lieu of the noted 3' dimension which is approved for 10 or 15-year warranted projects).

3. Carlisle Termination Bar is required in locations where a compression bar termination has been specified. The Termination Bar must also be used in conjunction with new or existing counterflashing.

4. Certain metal accessories by others may be permitted upon Carlisle acceptance for wind speed coverage less than 90 mph.

   Note: Conventional metal fascia systems that require flanges to be "stripped in" must be overlaid with Pressure-Sensitive Cured Cover Strip or utilize a 9" wide RUSS beneath the metal flange. Refer to the applicable details for requirements.

5. When a warranty wind speed of 80 mph or greater is desired, air infiltration must be prevented along the roof edge by adhering the membrane over the perimeter wood nailers and down the outside face of the building.