WeatherBond PRO Weld-Free TPO
Mechanically Attached Roofing System

Part II - Installation

May 2009

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THE INFORMATION CONTAINED HEREIN IS TO SERVE AS CRITERIA FOR WEATHERBOND INSTALLERS REGARDING THE APPLICATION OF THIS ROOFING SYSTEM.

A. PRECAUTIONS

1. The following projects should be forwarded to WeatherBond for review prior to installation:

   a. Projects exceeding the roof heights identified in "Attachment I," Membrane Fastening Criteria.

   b. Projects specified with a fastener length exceeding 12".

   c. Air pressurized buildings, canopies and buildings with large openings where the total wall openings exceed 10% of the total wall area on which the openings are located (such as airport hangars, warehouses and large maintenance facilities).

   d. Cold storage buildings and freezer facilities.

   e. Projects where TPO is expected to come in direct contact with petroleum-based products or other chemicals.

B. GENERAL JOB SITE CONSIDERATIONS

Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials. The Contractor shall follow all safety regulations as recommended by OSHA and other agencies having jurisdiction.

1. Subject to project conditions, it is recommended to begin the application of this roofing system at the highest point of the project area and work to the lowest point to prevent water infiltration. This will include completion of all flashings, terminations and daily seals.

2. On phased roofing, temporary closures should be provided to prevent moisture infiltration.

3. When possible on multiple level roofs, begin the installation on the highest level to avoid or minimize construction traffic on completed roof sections.

4. On projects at high altitudes (6,000' and above), rapid flash off (drying) of Bonding Adhesive and Splice Adhesive will occur due to low atmospheric pressure.

5. For existing standing seam, flat seam or corrugated metal roofs, this roofing system can be installed with the membrane secured to the structural purlins. For specific installation requirements, refer to the Metal Retrofit Roofing System Specifications, published separately.

C. JOB SITE MATERIAL STORAGE AND HANDLING

1. Deliver materials to the job site in the original, unopened containers.

2. When loading materials onto the roof, the WeatherBond Installer must comply with the requirements of the specifier/owner to prevent overloading and possible disturbance to the building structure.

3. Job site storage temperatures in excess of 90° F (32° C) may affect shelf life of curable materials (i.e., uncured flashing, adhesives, sealants, primers, Peel & Stick White EPDM Seam Tape and Pressure Sensitive/Peel & Stick Flashing/Accessories).

4. Cold temperatures will not restrict the installation of this roofing system. **When the temperature is expected to fall below 40° F (5° C)**, outside storage boxes should be provided on the roof for temporary storage of liquid adhesives, sealants, primers, Seam Tape and Pressure Sensitive Flashing/Accessories. Containers should be rotated to maintain their temperature above 40°F (5°C).

   Note: Prolonged exposure of Pressure Sensitive Flashing and Peel & Stick White EPDM Seam Tape to temperatures below 40°F (5°C) will cause the preapplied adhesive tape to lose tack and in extreme cases, not bond to the substrate. Refer to "Membrane Splicing with Seam Tape" for application procedures in colder temperatures.

5. Do not store adhesive containers with opened lids due to the loss of solvent, which will occur from flash off.

6. Insulation/underlayment must be stored so it is 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.

D. SUBSTRATE PREPARATION

1. **On retrofit-recover projects**, cut and remove wet insulation, as identified by the specifier, and fill all voids with new insulation so it is relatively flush (+/- 1/4") with existing surface.

   a. **For existing PVC membranes**, if membrane is not removed, it must be cut into maximum 10' by 10' sections. All PVC flashings at perimeters, roof drains and roof penetrations must be removed.

   b. When installing this roofing system over **an existing gravel surfaced built-up roof, loose gravel must be removed**. Power brooming is recommended by WeatherBond to remove the loose gravel that may trap moisture. Any uneven areas of the substrate must be leveled to prevent insulation from bridging.

   c. When installing this roofing system over an existing smooth surfaced modified bitumen, TPO membrane shall be positioned with the length of sheets parallel to modified bitumen field splices. At end laps or other locations where TPO splices intersect modified bitumen field seams, Peel & Stick (P&S) T-Joint Covers or 6" wide Peel & Stick Uncured EPDM Flashing must be applied over intersections.

2. **For all projects** (new or retrofit), the substrate must be relatively even without noticeable high spots or depressions, and accumulated water, ice or snow must be removed to prevent the absorption of moisture in the new roofing components and roofing system.

3. Prior to the placement of membrane underlayment, clear the substrate of debris and foreign material that may be harmful to the roofing system. Gaps greater than 1/4" must be filled with an appropriate material.

4. When the membrane is specified directly over or in conjunction with WeatherBond Approved Protective Mat on a new or existing approved substrate as outlined in "Design Criteria," Part I, the surface must be free of debris, fins and loose and foreign material.

E. VAPOR RETARDER INSTALLATION

Follow the respective vapor retarder manufacturer's recommended installation procedures and the specifier's instructions for the installation of the product specified.

F. INSTALLATION OF WOOD NAILERS (If Required)

1. Install wood nailers in those locations that have been designated by the specifier and as approved by WeatherBond.

2. The wood nailer must be installed so the top of the wood nailer is relatively flush (+/- 1/4") with the top surface of the membrane underlayment and the width of the wood nailer exceeds the width of the metal flange (where applicable at edgings, scuppers, etc) as shown on the appropriate WeatherBond detail.

3. Follow the specifier's guidelines for the securement of the wood nailers.

G. INSULATION PLACEMENT AND ATTACHMENT

To verify acceptability of an insulation/underlayment, refer to Part I, "Design Criteria."

1. Do not install more membrane underlayment/insulation than can be covered by membrane in the same day.

2. All insulation boards must be butted together with no gaps greater than 1/4". Gaps greater than 1/4" are not acceptable.

3. When multiple layers of insulation are specified, staggering of joints between layers is recommended.

4. **WeatherBond Approved Recovery Board, Dens-Deck and Polyisocyanurate Insulation** shall be mechanically fastened to the roof deck at the minimum rate of **1 per every 8 square feet** (refer to Detail WFMA-27.1 for fastening pattern).

CAUTION: **WeatherBond Approved Polyisocyanurate Insulation with a thickness less than 1.5" installed over an existing roofing membrane without a tearoff** must be mechanically fastened to the roof deck with a minimum of **1 fastener and plate for every 4 square feet** or less of insulation. Refer to Detail MA-WFMA-27.2 for fastening pattern.

5. **Foamular® DuraPink®** or **DOW Recovermate extruded polystyrene** insulation (by others) must be fastened at a minimum rate of **1 fastener and plate per 4 square feet**. Refer to Detail WFMA-27.3.

6. WeatherBond Rollout Membrane Underlayment (typically installed over smooth or gravel surfaced built-up roofs) shall be overlapped 2" and fastened every 15' at the lap to prevent movement.

7. When **gypsum board** is specified as the **membrane underlayment,** it must be fastened at the minimum rate of **1 per every 8 square feet** in accordance with WeatherBond's insulation fastening pattern. Refer to Detail WFMA-27.1 for fastening pattern.

8. When specified for insulation securement, WeatherBond Fasteners must be used in conjunction with WeatherBond 2 3/8" diameter Fastening Plates or 3" diameter Insulation Fastening Plates. As an option, WeatherBond FAST or DASH DC Insulation Adhesive may be used to secure insulation.

9. Fasteners by others may be used **for insulation securement** (when recommended by the manufacturer) with a corresponding fastening plate promoted as a complete fastener assembly and accepted by WeatherBond prior to installation.

10. For applicable WeatherBond Approved Fasteners and minimum deck penetration, refer to "Attachment I" at the end of this section.

H. MEMBRANE PLACEMENT AND SECUREMENT

1. **Ensure** that water does not flow beneath any completed sections of the membrane system by completing all flashings, terminations and daily seals by the end of each work day.

2. **Sweep** all loose debris from the substrate.

3. The type of WeatherBond Fastener and Fastening Plate used for membrane securement is dependent on the deck type. Refer to Attachment I, Membrane Fastening Criteria, at the end of this section for specific fastener and plate requirements.

4. The number of perimeter sheets, their fastening density and field membrane securement requirements, must comply with the membrane fastening chart included on "Attachment I" at the end of this section.

5. **Perimeter Membrane Securement**

The roof perimeter is defined as all edges of each roof section. Where multi-level roofs meet at a common wall, the adjacent edge of the upper roof is treated as a roof perimeter if the difference in height is greater than 3'. Perimeter sheets are not required at the base of the wall at the lower level. Refer to Detail WFMA-2 at the end of this section for further information.

Note: Expansion joints, control joints, and fire walls in the field of the roof or roof ridges with slopes less than 3" to the horizontal foot shall not be considered as part of the roof perimeter.

a. **Use of 6', 5' or 4' wide perimeter sheets**:

When using 12' or 10' wide field sheets, 6' or 5' wide perimeter sheets shall be used. When 8' wide field sheets are to be utilized, perimeter sheets shall be 4' wide. Refer to Detail WFMA-21 for requirements.

b. **Use of 10" wide TPO Pressure-Sensitive (PS) RUSS**:

As an option to using perimeter sheets, 10" wide TPO PS RUSS can be used beneath the field sheets for perimeter securement.

1) The underside of the deck membrane must be primed with TPO Primer where contact with RUSS will occur.

2) When field sheets are positioned parallel to the roof perimeter, 10" wide PS RUSS is placed approximately down the center of the field sheet. When a RUSS divides a field sheet in half, 2 perimeter sheets are created.

3) When field sheets extend perpendicular to the edge of the roof, install 10 inch wide PS RUSS beneath the field membrane sheets approximately 4' – 5' from the edge of the roof. When multiple perimeter sheets are required, additional RUSS shall be positioned 4' – 5' from the previous RUSS.

Note: When fastening 10" Pressure-Sensitive RUSS, position approved fasteners/plates along the center line of the RUSS. **6" wide TPO PS RUSS cannot be used to create perimeter sheets.**

4) Refer to Detail WFMA-2 for applicable requirements.

6. **Field Membrane Securement**

Position adjoining field membrane sheets (12', 10' or 8' wide) to allow an approximate overlap as described in Section I of this manual.

7. **Secure the membrane** at the approved fastening density with the required WeatherBond Fastener and Fastening Plates. (See Attachment I)

8. For installation of membrane with fullness, tighten the sheet between fasteners as follows:

   a. Unroll sheets and position.

   b. Place a fastener and plate in one end of the sheet on the appropriate fastener mark. Go to the opposite end of the sheet, pull it tight and place a fastener and plate at the appropriate mark. Place the remaining fasteners into the sheet.

   c. Finish the seam according to the instructions in Section I- Membrane Splicing with White EPDM Peel & Stick Seam Tape.

9. Prevention of membrane distortion during windy conditions:

   a. Unroll sheet approximately 5' and position edge of membrane with overlap line on adjacent sheet.

   b. Install fasteners along the 5' exposed edge.

   c. As sheet is being fastened , unroll only enough membrane to stay a few feet ahead of the fastening process. This reduces amount of unsecured membrane to be distorted by wind.

   d. Continue this process for each adjoining sheet.

I. MEMBRANE SPLICING WITH WHITE EPDM PEEL & STICK (P&S) SEAM TAPE

1. **General**

   The following splice procedures are for use with WeatherBond PRO TPO Membrane.

   a. Peel & Stick Seam Tape must extend 1/8" to 1/2" beyond the splice edge.

   b. Field splices at roof drains must be located outside the drain sump.

   c. **Prior to Peel & Stick Seam Tape application, the splice area must be primed with TPO Primer.**

   d. **Cold Weather Restriction - When Temperatures are below 40°F (5° C)**

      1) Seam tape must be stored in a warm, dry area. Hot boxes must be provided for temporary storage to maintain the temperature of the tape above 40°F (5°C).

      2) After TPO Primer has been applied and allowed to properly dry, **heat the primed area of the bottom membrane sheet** with a hot air gun as the tape is applied and pressed into place.

      3) When temperatures will fall below 20° F (-7°C), use a steel roller to apply pressure to the tape prior to removing the release film.

      4) Position the top sheet and remove the release film. Prior to rolling the splice with the 2" steel roller, apply heat to the top side of the splice area with a hot air gun. The heated surface should be very hot to the touch of bare skin (approximately the temperature of hot tap water). Take care not to burn or blister the membrane.

   e. In **warmer temperatures**, it is recommended to keep PEEL & STICK Seam Tape in a shaded area out of direct sunlight.

2. Mechanically Attached Option #1

a. Using the preprinted X's on the bottom sheet, arrange 2 3/8" seam fastening plates a maximum of 12" on center and fasten the bottom sheet with a WeatherBond HPWX fastener. If there are no X's, place the center of the plate approximately 2" from the edge of the sheet, a maximum of 12" on center and fasten with a WeatherBond HPWX fastener.

b. Place marks 6" from the edge of the bottom sheet, the entire length of the sheet. This will achieve the minimum seam required.

c. Align the top sheet along the marks and measure and mark 1/8" to ½" beyond the edge of the top sheet for tape placement. This will achieve the minimum seam and will allow for the 1/8" to ½" exposure of tape.

d. Fold the top sheet back to expose the seam area.

e. Using a medium nap paint roller, apply WeatherBond TPO Primer to the seam area, using back and forth strokes with moderate pressure until the seam surface has complete coverage. Apply the WeatherBond TPO Primer past the seam edge to the marks. **Allow** Primer to dry until tacky but does not transfer to a dry finger touch.

The coverage rate of TPO Primer is approximately 200-250 square feet per gallon (one surface).

Note: Due to solvent flash-off, condensation may form on freshly applied TPO Primer when the ambient temperature is near the dew point. If condensation develops, the application of Primer and Seam Tape must be discontinued since proper adhesion will not be achieved. Allow the primer surface to dry and apply a thin freshener coat of TPO Primer to the previously coated surface and apply Seam Tape when conditions allow.

f. **Unroll** approximately 3' of Seam Tape. Align the edge of the tape (not the release film) with the marked line and press tape down to bottom sheet using firm even hand pressure. Continue for the length of the splice. Tape roll ends must be overlapped 1".

g. Using moderate pressure, set the Peel & Stick Seam White EPDM Seam Tape into place to avoid air entrapment.

h. Fold the top membrane back onto the bottom membrane. Ensure that the Seam Tape is exposed 1/8" to ½" beyond the edge of the top sheet. If the Seam Tape does not extend beyond the leading edge, the membrane should be respositioned to achieve the 1/8" to ½" exposure.

i. Fold back the top sheet and prime the seam area and allow to dry

j. Roll back onto the bottom sheet. Reaching under the top ply of membrane, pull the release paper away from the Peel & Stick Seam Tape at a 45 degree angle. While removing the paper, draw your hand across the seam, from the back to the leading edge. This will prevent wrinkles and fish mouths from forming in the seam.

k. After the paper is removed, roll the entire length of the seam with a hand roller, always sroll across the seam.

3. Mechanically Attached Option #2 (Coastal and High Wind Areas)

a. Arrange 2 3/8" seam fastening plates so that the center of the plate is 4 ½" from the edge of the sheet and fasten with WeatherBond HPWX Fasteners a maximum of 12" on center.

b. Position membrane sheets to allow for the required minimum splice overlap of 8 ½" along the length of the sheet. Mark the bottom sheet with an indelible marker approximately 1/4" to 1/2" from the top sheet edge.

c. TPO Primer is applied using a medium nap roller to achieve a thin even coat to the bottom sheet on both sides of the fasteners and plates where the White EPDM Peel & Stick seam tape will be placed.

The coverage rate of TPO Primer is approximately 200-250 square feet per gallon. This equates to approximately 185 linear feet per gallon for a completed 6 inch wide splice area and approximately 300 linear feet per gallon for a completed 3" wide splice area (primer applied on a 5" wide area on both membrane surfaces).

d. **Allow** Primer to dry until tacky but does not transfer to a dry finger touch.

Note: Due to solvent flash-off, condensation may form on freshly applied TPO Primer when the ambient temperature is near the dew point. If condensation develops, the application of Primer and Seam Tape must be discontinued since proper adhesion will not be achieved. Allow the primer surface to dry and apply a thin freshener coat of TPO Primer to the previously coated surface and apply Seam Tape when conditions allow.

e. **Unroll** approximately 3' of Seam Tape. Align release film with marked line and press tape down to bottom sheet using firm even hand pressure. Continue for the length of the splice. Tape roll ends must be overlapped 1". In 8 1/2" splice areas apply a second row of 3" seam tape along the edge of the bottom sheet on the other side of the plates and fasteners.

f. **Reposition the top sheet** to ensure that there will be a minimum of 1/8" to ½" of Peel & Stick Seam Tape exposed when the seam is closed.

g. Roll the top sheet back and prime the seam area. Ensure that enough of the sheet is being primed to accommodate the two rows of Seam Tape on the bottom sheet with TPO Primer. **Allow** Primer to dry until tacky but does not transfer to a dry finger touch.

h. **Lightly apply pressure with a steel roller to the tape (with release film still in place) along the entire length of the splice.** Allow top sheet to rest on release film on backside of tape.

Note: Tape placement is critical to obtain a minimum splice width of 8-1/2" using two rows of 3" wide Seam Tape; one row on each side of the fasteners and plates.

A minimum of 1/8" to a maximum of 1/2" of tape must extend beyond the splice edge. A continuous piece of Seam Tape must be used at all field splice intersections.

i. **Pull** release film from Seam Tape beneath the top sheet and allow the top sheet to fall freely onto exposed tape. Start with the row of seam tape farthest from the top sheet edge.

j. **Press** the top sheet onto the tape using firm even hand pressure across the splice towards the splice edge.

k. **Immediately roll** the splice with a 2" wide steel roller, using positive pressure. Roll across the splice edge, not parallel to it.

l. **Install** WeatherBond's Pressure Sensitive "T" Joint Covers or a 6" wide section (with rounded corners) of Pressure Sensitive Flashing over **all field splice intersections**. Refer to WFMA-2.3.

J. LAP SEALANT APPLICATION

1. **General**

a. **Lap Sealant is required on Pressure Sensitive Flashing and Pressure Sensitive** accessories (pipes, corners, Pourable Sealer Pockets, etc.).

Lap Sealant is required at the following locations:

1) Splice tape overlaps.

2) Splices between adjoining sections of Pressure Sensitive Flashing.

3) Intersections between Pressure Sensitive Flashing and joints in metal edgings.

2. Apply a **5/16" (minimum 1/4") diameter bead** of White Lap Sealant. When a 5/16" diameter bead of Lap Sealant is applied, approximately 22 linear feet of coverage per tube can be achieved.

3. **Feather** the Lap Sealant with the specially preformed tool or nozzle (included in the Lap Sealant cartons) so the high point or crown of the Lap Sealant is located over edge of splice.

   Clean the feathering tool occasionally for consistent crowning of Lap Sealant.

4. **APPLICATION OF LAP SEALANT SHOULD BE COMPLETED BY THE END OF THE DAY.** Delayed Lap Sealant application (not within the same day) will require scrubbing of accumulated dirt and dust along the splice edge, rinsing with clean water and cleaning with Weathered Membrane Cleaner or Primer.

K. ADDITIONAL MEMBRANE SECUREMENT

Securement must be provided at the perimeter of each roof level, roof section, expansion joint, curb, skylight, interior wall, penthouse, etc., at any inside angle change where slope exceeds 2" to one horizontal foot, and at all penetrations as identified on the WeatherBond details.

Securement may be achieved as follows:

1. WeatherBond 's HPWX Fastening Plates are used to secure the membrane at the base of walls and penetrations and flashed as shown on the applicable WeatherBond detail (excluding OSB, cementitious wood fiber and gypsum decks where the required WeatherBond Fastener is installed with the associated 2 3/8" diameter plate).

2. As an option, 6" wide **TPO PS RUSS** may be installed in conjunction with WeatherBond Fasteners and HPWX Plates spaced a maximum of 12" on center below the membrane (HPWX Fasteners and HPVX Plates are required over steel and wood decks). The securement strip shall be installed horizontally at the base of walls or penetrations.

   The underside of the deck membrane must be primed with TPO Primer. Membrane is spliced to the PS RUSS and continued as wall flashing resulting in continuous membrane flashing without penetration of the deck membrane.

1. Securement of the membrane shall be a maximum of 12" on center. Fasteners shall be positioned 6" minimum to 9" maximum from the inside or outside corner.

2. When mechanical securement is not provided in some of the WB Weld-Free TPO Details (i.e., pipes and sealant pockets), additional Fastening Plates must be used for membrane securement. The plates must be positioned a maximum of 12" away from the penetration, spaced a maximum of 12" on center and flashed in accordance with the applicable WeatherBond Detail.

3. Refer to the "Membrane Fastener Criteria" chart in "Attachment I" at the end of this section for the required WeatherBond Fastener/Plate with the corresponding deck type.

4. After securing the membrane, flash in accordance with the appropriate detail.

L. FLASHING

1. **General Flashing Considerations**

   a. All existing **loose** flashing must be removed prior to the application of new membrane. New membrane flashing must extend above all existing intact flashing but must not conceal weep holes or cover existing throughwall counterflashing.

   b. Install surface mounted reglets and compression bar terminations directly to the wall surface.

c. All vertical field splices at the base of a wall or curb must be overlaid with Pressure Sensitive White “T” Joint Covers, a 6" by 6" section (with rounded corners) of Pressure Sensitive White Uncured TPO Flashing.

d. **Peel & Stick Uncured EPDM Flashing** must be limited to the overlayment of vertical seams (as required at angle changes), or to flash inside/outside corners, vent pipes, scuppers and other unusually shaped penetrations where the use of Molded Pipe Seals or Pressure Sensitive Cured Cover Strip is not practical.

Note: Even when working in elevated temperatures, in most cases a heat gun will be required to elevate the temperature of Pressure Sensitive White Uncured Flashing between 105° F and 110° F (40 and 43°C) to permit proper forming of the uncured flashing.

e. When using **Pressure Sensitive Cured Cover Strip** to overlay 2 3/8” Seam Fastening Plates or metal edging flanges, etc., **WeatherBond TPO Primer** must be used to clean the membrane and metal flanges.

Note: When using Pressure Sensitive White products in colder temperatures, use a heat gun to warm the product. Apply heat to the TPO flashing side of the product. Do not apply heat directly to the preapplied adhesive. The Pressure Sensitive White Flashing must be applied immediately after Primer flashes off. Refer to “Membrane Splicing with Peel & Stick Seam Tape” for application procedures in colder temperatures.

f. In areas where metal counterflashing or surface mounted reglets are used as the vertical termination, they must be sealed with a rubber grade caulking to prevent moisture migration behind the new wall flashing.

g. WeatherBond's Termination Bar (with Water Cut-Off Mastic) should be installed under all metal counterflashings and surface mounted reglets used for vertical wall terminations.

2. **Walls, Parapets, Curbs, Skylights, etc.**

a. Use continuous deck membrane with Pressure Sensitive RUSS (Reinforced Universal Securement Strip) or 2 3/8” Seam Fastening Plates along the base of the wall.

1) When using Pressure Sensitive RUSS, refer to Paragraph L, Additional Membrane Securement, for attachment criteria.

2) When 2 3/8” Seam Fastening Plates are used to secure continuous deck membrane, use minimum 6" wide Pressure Sensitive Cured Cover Strip to overlay fasteners and plates.

b. When the use of continuous deck membrane for wall flashing is not feasible, a separate piece of cured TPO membrane may be used.

1) When **Peel &Stick Seam Tape** is used, the **membrane and flashing** (Cured TPO Flashing) must be cleaned with **WeatherBond Primer**. Refer to “Membrane Splicing with Peel & Stick Seam Tape” for splicing procedures.

c. Adhere flashing to the wall and terminate in accordance with the applicable WFC-9 Termination Details.

d. Use a Peel & Stick White “T” Joint Cover, 6" by 6" Peel & Stick White Uncured TPO Flashing or Uncured Flashing with rounded corners (maximum 10-year warranty) to overlay vertical splices as shown on the applicable WFC-12 Detail.

e. Refer to WFC-15 Details for various corner flashing options.

3. **Roof Drains (WFC-6 Details)**

a. Provide a smooth transition from the roof surface to the drain clamping ring. Prepare the substrate around each roof drain to avoid membrane bridging in excess of 2" at the sump area and possible distortion at the drain

clamping ring.

Note: When reinforced membrane has been specified and the slope at the drain sump is greater than 3" in 12", a separate piece of cured non-reinforced membrane must be extended into the drain sump as shown on the applicable detail.

b. The mating surfaces between the clamping ring and drain base must be clean and have a smooth finish.

c. Field splices at roof drains must be located at least 6" outside the drain sump.

d. Cut membrane so it extends approximately 1/2" beyond the attachment points of the clamping ring. The hole in the membrane must not restrict water flow or be smaller than the drain pipe.

e. Remove all existing flashing material to prepare for the membrane seal (application of WeatherBond Water Cut-Off Mastic).

f. All bolts and/or clamps must be in place to provide compression on the Water Cut-Off Mastic.

g. Use drain strainers, which have been approved by the specifier in accordance with applicable codes.

4. **Other Penetrations**

a. Flash pipes and round supports with Molded Pipe Seals or Pressure Sensitive White Pipe Seals, when feasible, in accordance with the applicable detail.

b. Form Field Fabricated Pipe Seals using Pressure Sensitive White Uncured EPDM Flashing around pipes, round supports and structural steel tubing with corner radius greater than 1/4" in accordance with WFC-14 Details.

c. When flashing seamless metal posts, maximum 4" by 4", with a corner radius less than 1/4", apply a field fabricated pipe flashing with a double vertical wrapping.

d. Flexible penetrations (braided cables, conduits, wires, etc.) must be enclosed in a stable gooseneck and flashed in accordance with the applicable WFC-14 Detail.

e. Hot pipes which exceed 180° F must be insulated with metal collars and rain hoods and flashed in accordance with the applicable WFC-14 Details.

f. For pipe clusters or unusually shaped penetrations, a pourable sealer pocket must be utilized. Refer to applicable WFC-16 Details.

M. ROOF WALKWAYS

Install walkways in locations designated by the specifier in accordance with “Design Criteria,” Part I.

WeatherBond Pressure--Sensitive Molded Walkway Pads (with Factory-Applied Tape) or Walkway Rolls

If a 30' long walkway roll is to be used, the White Seam Tape must be applied to the side of the walkway, which faces upward after unrolling to prevent curling. Allow a 1" wide break between maximum 10' lengths of walkway roll. Round all corners of the walkway roll prior to application.

Discontinue walkways over all field splices to provide a minimum 1" gap over the seam edge.

1. **Attachment With White EPDM Peel & Stick Seam Tape/WeatherBond TPO Primer**

a. If necessary, **scrub** the membrane with Weathered Membrane Cleaner to remove contaminants. Rinse with clean water and allow to dry.

b. When using Pressure-Sensitive Walkway Pads, prime the membrane surface with TPO Primer and allow to properly dry. When using walkway rolls, prime the mating surfaces of the membrane and underside of the walkway roll with TPO Primer and allow to dry.

c. If walkway rolls are used, the Peel & Stick Seam Tape positioning (along the width or length of the pad) will vary depending on direction of roof slope; however, the maximum distance between parallel rows of tape shall not exceed 15".

d. **Remove** release film from Peel & Stick Seam Tape and place walkway pad/roll over the TPO Primer applied to the TPO membrane.

e. **Walk** the pad/roll into place to ensure proper adhesion.

Note: On WeatherBond White Roofing Systems, when aesthetics are of importance, care should be exercised when applying Primer to membrane surface to avoid discoloration outside walkway area.

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N. DAILY SEAL

1. On phased roofing, when the completion of flashings and terminations is not completed by the end of each work day, provisions must be provided to temporarily close the membrane to prevent water infiltration.

2. Temporarily seal any loose membrane edge down slope using Thermoplastic Pourable Sealer. Caution must be exercised to ensure the membrane is not temporarily sealed near drains in such a way as to promote water migration below the membrane.

3. Pourable Sealer, when utilized, shall be applied as follows:

   a. On existing built-up roofs, remove the gravel. The surface must be clean and dry.

   b. Apply the Pourable Sealer along the loose edge of the TPO membrane. If necessary, use a trowel to spread Pourable Sealer to achieve complete coverage.

   c. After embedding the membrane in Pourable Sealer, CHECK FOR CONTINUOUS CONTACT. Provide continuous pressure over the length of the temporary seal with 15' lengths of 2-1/2" diameter Lay Flat Tubing filled with dry sand.

   Note: Wood nailers will not provide constant compression due to warping and an uneven substrate.

   d. When work is resumed, pull the membrane free; trim and remove where the Pourable Sealer was applied.

4. When using urethane foam as a daily seal, follow manufacturer's installation requirements. Trim and remove membrane where urethane foam is applied.

This specification represents the applicable information available at the time of its publication. Owners, specifiers and WeatherBond Installers should consult WeatherBond or their WeatherBond Independent Sales Representative for any information that has subsequently been made available.

Review the appropriate WeatherBond warranty for specific warranty coverage, terms, conditions and limitations.

"Attachment I"
Membrane Fastening Criteria
May 2009

A. The following chart indicates the appropriate WeatherBond Fasteners and Plates for membrane securement with the referenced roof deck and includes minimum penetration requirements and pilot hole criteria. For minimum pullout requirements, refer to Attachment II, Withdrawal Resistance Criteria, in Part I, Design Criteria.

Deck/Parapet Type	WeatherBond Fasteners and Required Membrane Fastening Plates	Minimum Penetration	Pilot Hole Depth	Pilot Hole Diameter
Steel, 22 gauge (.75 mm) or heavier or Lightweight Insulating Concrete over Steel	HPWX Fasteners/ HPWX Plates	3/4"	N/A	N/A
Structural Concrete, rated 3,000 psi or greater	Contact WeatherBond	1"	(1)	7/32"
	MP 14-10 Fasteners/HPVX Plates	1"	(1)	3/16"
Wood Plank or minimum 15/32" (12 mm) thick Plywood	HPWX Fasteners/HPWX Plates	Min. 1" (2)	N/A	N/A
Minimum 7/16" (11 mm) thick Oriented Strand Board (OSB)	HPWX/ HPWX Plates	1"	N/A	N/A
Cementitious Wood Fiber	Contact WeatherBond	1-1/2"	(4)	N/A
Gypsum	Contact WeatherBond	1-1/2"	(1)	7/16", 1/2" or 9/16" (5)
Masonry (block, brick or concrete)	Term Bar Nail-In (6)	3/4"	(1)	1/4"

Notes:

(1) The pilot hole must be predrilled to a sufficient depth to prevent contact between the fastener point and any accumulated dust in the predrilled hole. This will help prevent bottoming out of the fastener during installation.

(2) For wood planks only, fastener penetration shall not exceed 1-1/2".

(3) Most cementitious wood fiber decks do not require predrilling; however, WeatherBond should be contacted prior to installation for verification of specific types that may require a pilot hole to be predrilled.

(4) Pilot hole size may be varied to maximize pullout resistance.

(5) Used for the securement of compression bar terminations or 2 3/8" Seam Fastening Plates (used for additional membrane securement into vertical masonry surfaces). Do not use for insulation or primary membrane securement.

N/A = Not Applicable

For designation of wind zones listed on the following chart, refer to Basic Wind Speed Map in this Attachment.

To determine appropriate securement requirements, identify project wind zone from the map (at the end of this section) and select the chart based on project deck type. The building height is then used to determine membrane securement requirements for the project.

Wind Zone	Deck Type (1)	Building Height	Field Membrane Width	Fastening Density (Field & Perimeter Sheets)
Zone 1 Up to 100 MPH	Steel, Lightweight Insulating Concrete over Steel, Structural Concrete, Wood Planks	Max. 40'	12'	12" O.C.
	Steel, Lightweight Insulating Concrete over Steel, Structural Concrete, Plywood, Wood Planks or Oriented Strand Board (3)	Max. 75'	10'	12" O.C.
	Gypsum and Cementitious Wood Fiber	Max. 75'	10'	9" O.C.
			8'	12" O.C.
Zone 2 100-119 MPH	Steel, Lightweight Insulating Concrete over Steel, Wood Planks (New or Tearoff)	Max. 40'	12'	6" O.C.
	Steel, Lightweight Insulating Concrete over Steel, Wood Planks (Reroof /No Tearoff)	Max. 40'	12'	12" O.C.
	Steel, Lightweight Insulating Concrete over Steel, Plywood, Wood Planks or Oriented Strand Board (3)	Max. 50'	10'	12" O.C.
	Structural Concrete	Max. 40'	12'	12" O.C.
		Max. 75'	10'	12" O.C.
	Gypsum and Cementitious Wood Fiber	Max. 50'	10'	9" O.C.
			8'	12" O.C.
Zone 3 120-129MPH (4)	Steel or Lightweight Insulating Concrete over Steel	Max. 75'	10'	9" O.C.
			8'	12" O.C.
	Structural Concrete	Max. 50'	10'	12" O.C.
	Plywood, Wood Planks (2), Oriented Strand Board (3), Gypsum and Cementitious Wood Fiber	Max. 50'	8'	9" O.C.
Zone 4 130 MPH or Greater	Steel or Lightweight Insulating Concrete over Steel	Max. 75'	10'	6" O.C.
			8'	9" O.C.
	Structural Concrete	Max. 50'	8'	12" O.C.
	Plywood, Wood Planks (2), Oriented Strand Board, Gypsum or Cementitious Wood Fiber	N O T A C C E P T A B L E (2)		

Notes:

(1) Refer to "Attachment II, for minimum roof deck/pullout requirements and the required WeatherBond Fastener.

(2) On plywood or wood plank decks, if pullout tests exceed 425 pounds per fastener, the membrane securement requirements for steel decks may be followed providing the pullout tests are submitted to WeatherBond for approval.

(3) On oriented strand board decks less than 5/8" in thickness, HPWX Fasteners are required for membrane securement. For oriented strand board decks 5/8" thick or greater, HPWX Fasteners may be used for membrane securement if a minimum pullout value of 360 pounds can be achieved.

(4) Those areas located between wind zone contours of 120-129 MPH within 20 miles of the coastline shall be considered as a Zone 4 Wind Zone.

B.. **Perimeter sheets are required along the roof perimeter** which is defined as all edges of each roof section. Where multi-level roofs meet at a common wall, the adjacent edge of the upper roof is treated as a roof perimeter if the difference in height is greater than 3'. Perimeter sheets are not required at the base of the wall at the lower level. Refer to Detail WFMA-2 for further information.

The number of perimeter sheets required is dependant on project wind zone and building height as identified in the chart below. **At roof ridges** (when slopes exceed 3" to the horizontal foot), one perimeter membrane sheet, centered approximately over the roof ridge is required.

1. **When using 12' and 10' wide field sheets, 6' or 5' wide perimeter sheets** are utilized along roof edges.

2. **When using 8' wide field sheets, 4'wide perimeter sheets** are utilized along roof edges.

3. As an option to the use of 6', 5' or 4' wide perimeter sheets, 10" wide TPO PS RUSS can be used beneath the field sheets to create perimeter sheets. Refer to Paragraph H, Membrane Placement and Securement for requirements.

Wind Zone	Building Height	# of Perimeter Sheets Required (Note 1)
Up to 100 mph (Zone 1)	Up to 50'	1 or 2 (see Note 2)
	51' to 75'	2
100 to 129 (Zones 2 & 3)	Up to 75'	2 (Note 3)
130 mph or Greater (Zone 4)	Up to 75'	4

Notes
1. Fastener spacing for perimeter membrane sheets is equivalent to the fastener spacing for field sheets.
2. Two perimeter sheets required when 12' sheets are fastened 12" o.c.
3. Gypsum and cementitious wood fiber decks in Zone 3 require 3 perimeter sheets.

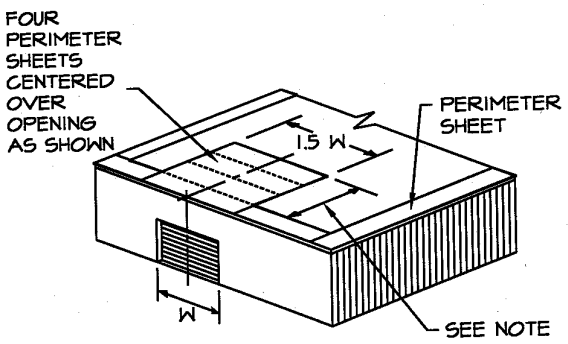
C. Buildings With Large Openings and Overhangs

When any wall contains major openings with a combined area which exceeds 10% of the total wall area on which the openings are located, four (4) perimeter sheets (centered over the opening) must be specified as shown.

1. When using 12' or 10' wide field membrane sheets, 6' or 5' wide perimeter sheets are utilized. When using 8' wide field sheets, 4' wide perimeter sheets are utilized. As an option, 10" wide TPO PS RUSS can be used beneath the field sheets to form perimeter sheets.

2. As an option to the above perimeter securement, an adhered membrane section may be used in lieu of the mechanically-attached membrane at large openings in accordance with the WeatherBond Specification for WB PRO Weld-Free TPO Adhered Roofing Systems.

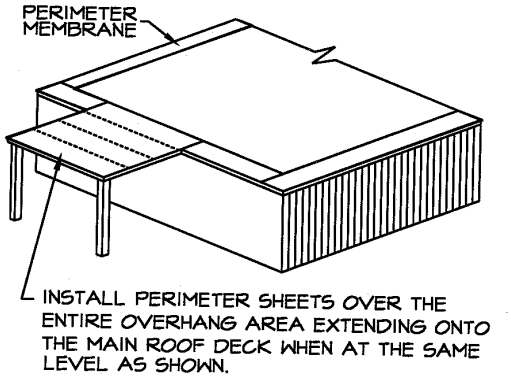
Large Openings



Note: Fastening plates are required at the end laps of the perimeter membrane sheets on both sides of the opened area.

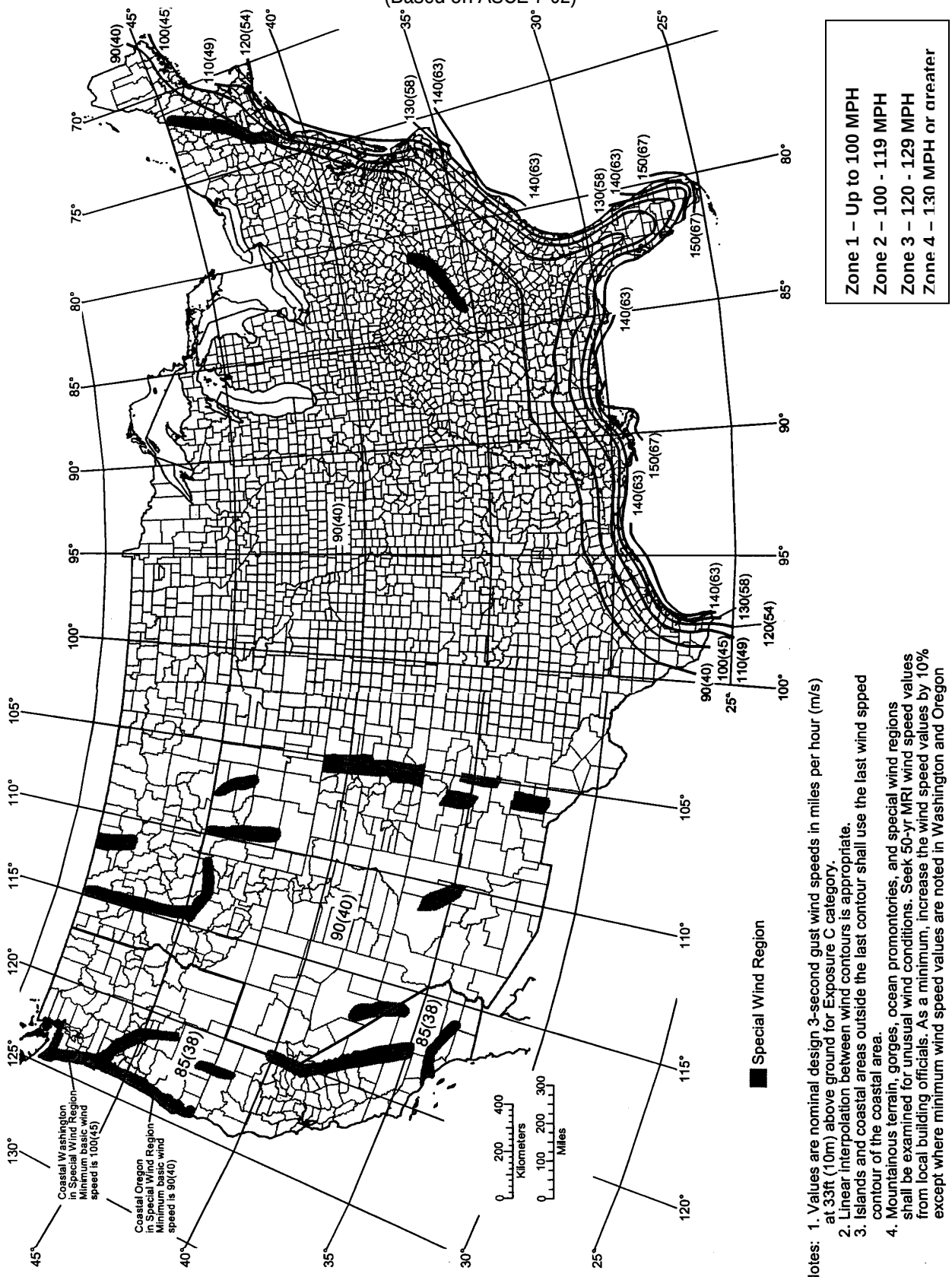
Overhangs

The membrane must be specified with perimeter sheets installed over the entire overhang area extending onto the main roof deck when at the same level.

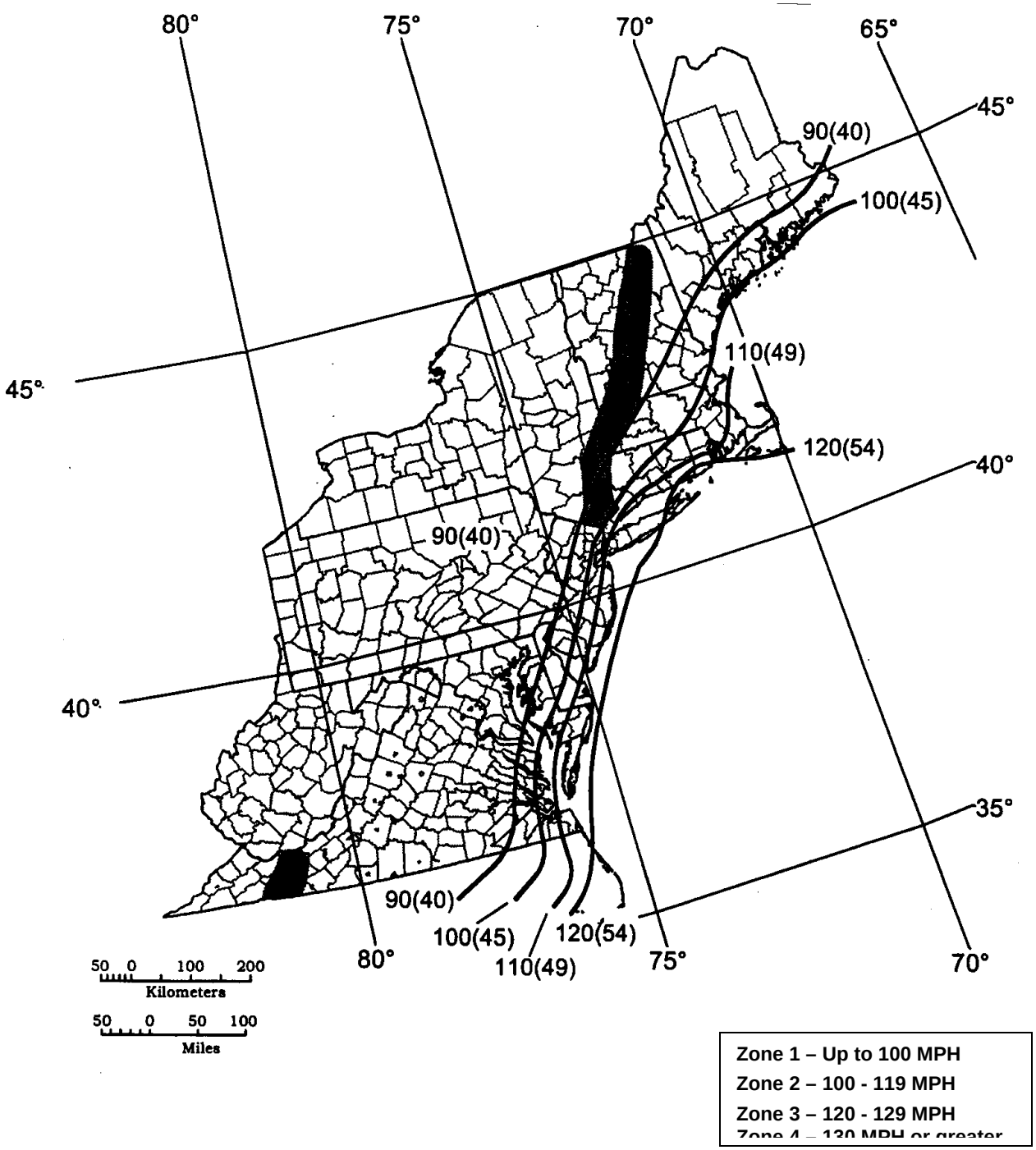


Basic Wind Speed Map

(Based on ASCE 7-02)



Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33ft (10m) above ground for Exposure C category.
2. Linear interpolation between wind contours is appropriate.
3. Islands and coastal areas outside the last contour shall use the last wind spped contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions. Seek 50-yr MRI wind speed values from local building officials. As a minimum, increase the wind speed values by 10% except where minimum wind speed values are noted in Washington and Oregon



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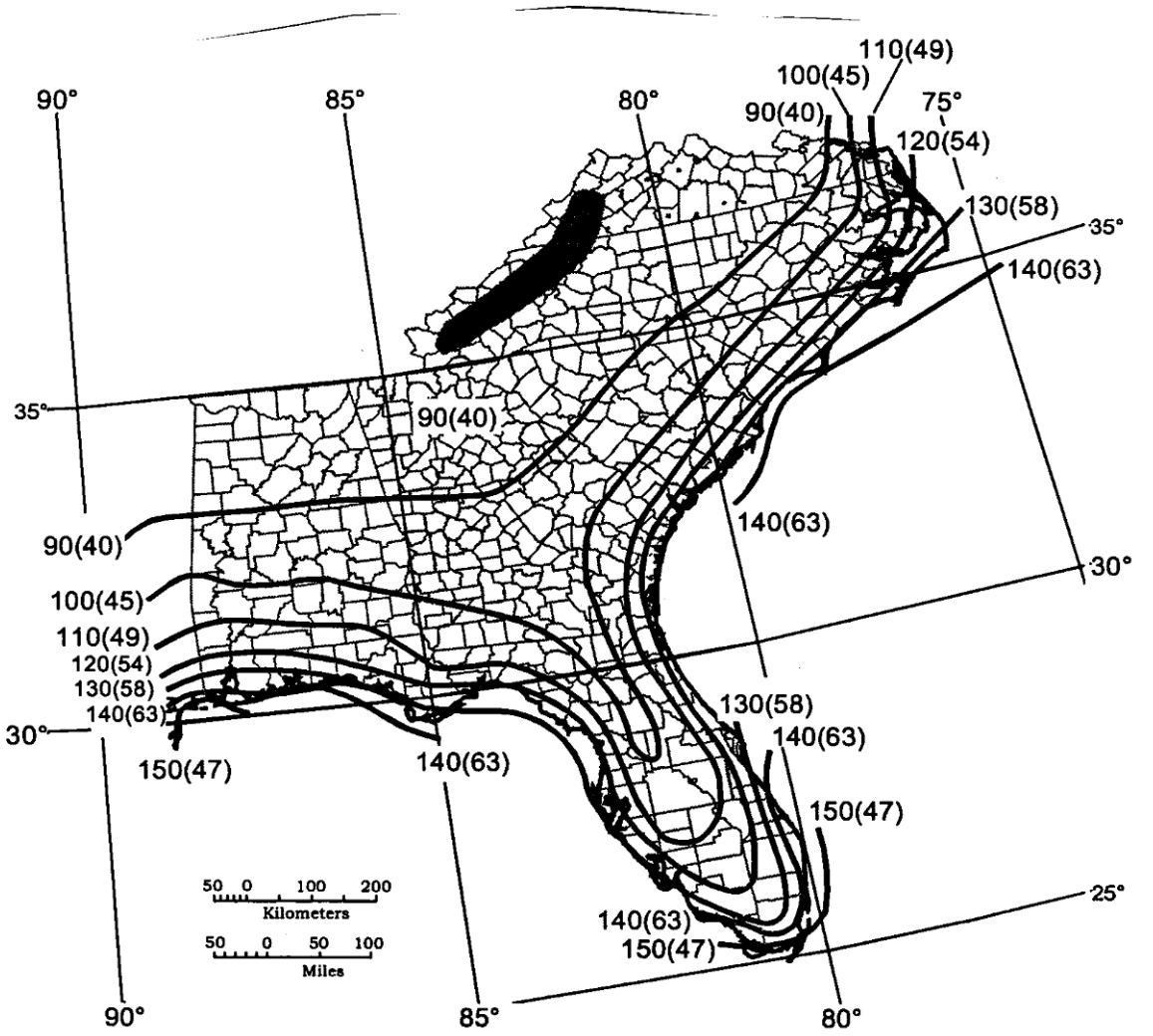

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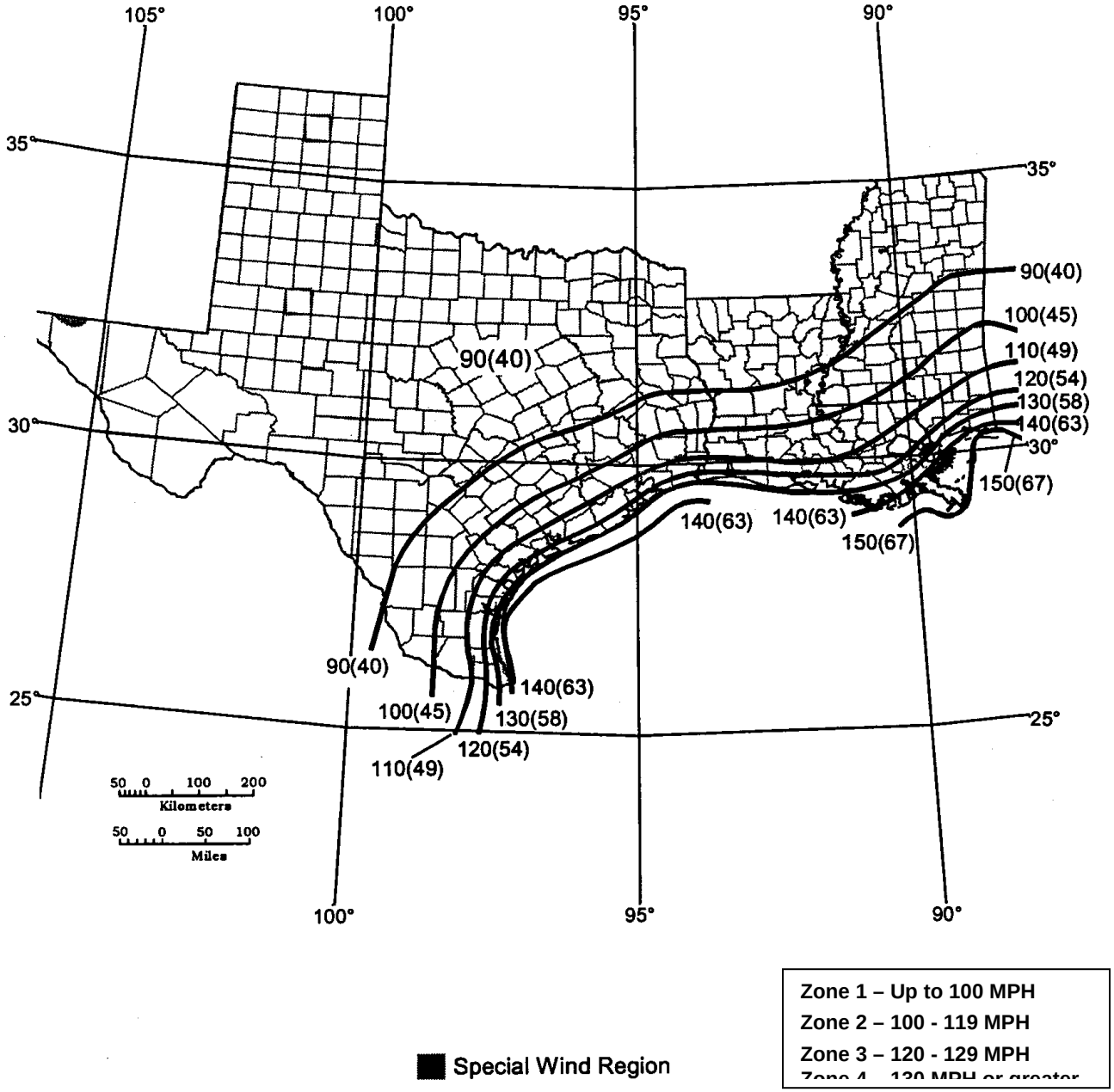

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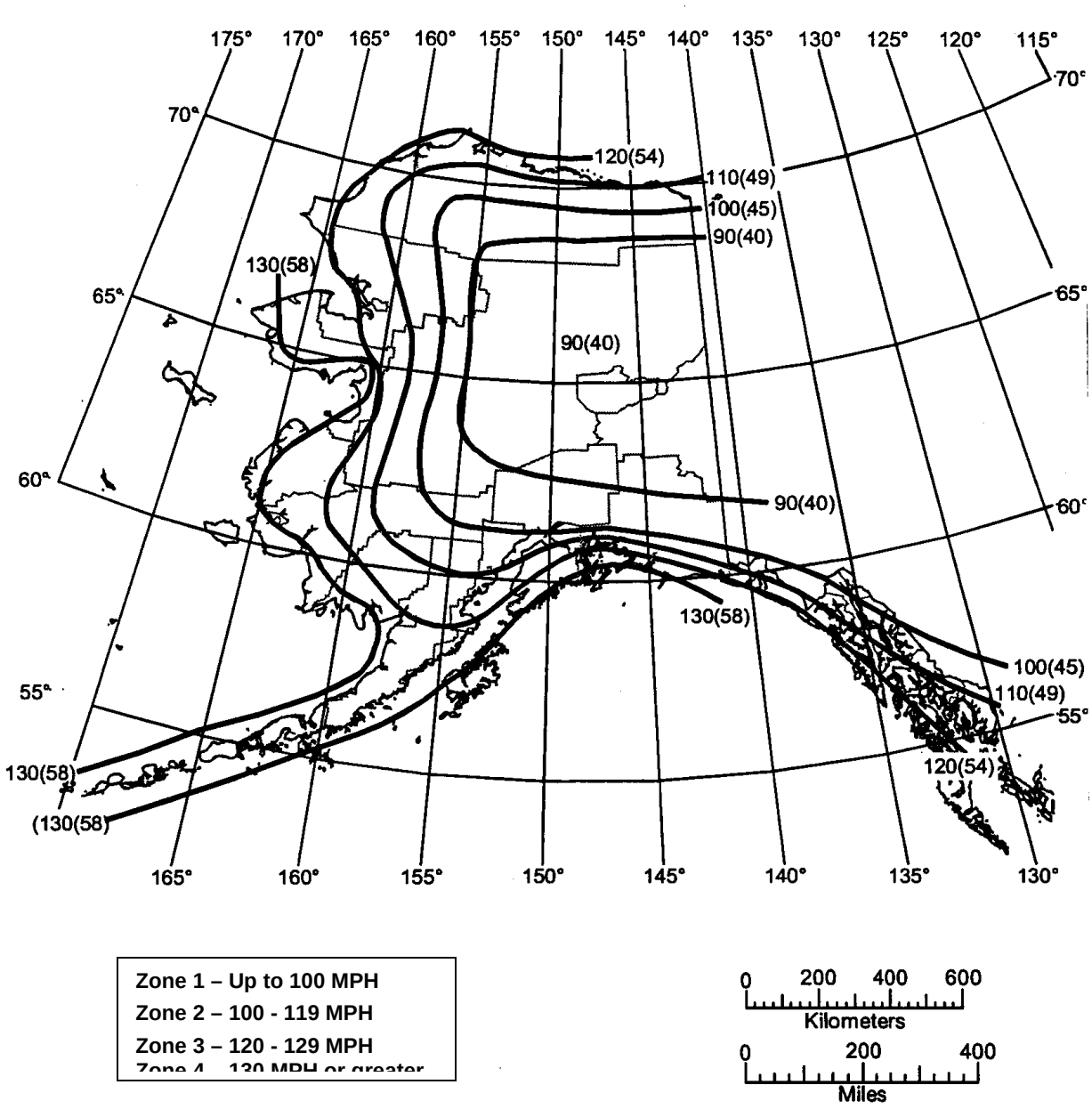

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WeatherBond PRO Weld-Free TPO Fully Adhered Roofing System

"Attachment II"
Membrane and Splice Repairs

May 2009

A. GENERAL

1. Prior to initiating repairs, the membrane must be cleaned to remove field dirt and other contaminants. Using a scrub brush, scrub the splice areas with warm water and a low-sudsing soap (Spic and Span, Tide, Lestoil). Rinse with clean water and allow to dry prior to applying Weathered Membrane Cleaner or TPO Primer as required.

2. Saturate a clean natural fiber rag (cotton) with Weathered Membrane Cleaner and scrub the area in a circular motion. Continue cleaning until the surface is a consistent matte black color without streaking.

   Note: Extreme conditions of accumulated dirt may require detergent and water cleaning as referenced above.

B. REPAIRS OF CUTS AND TEARS (Surface Splice)

Repairs to cuts and tears in the membrane must be accomplished by splicing a membrane section over the affected area.

1. Select a repair membrane, which is the same material as that to be repaired.

2. When using Pressure Sensitive White Cured Cover Strip or Peel & Stick Seam Tape for repairs, after thoroughly cleaning the membrane to remove field dirt, etc., apply TPO Primer to the splice areas. Apply Pressure Sensitive White Cured Cover Strip and roll the splice areas. Apply pressure sensitive "T" Joint Covers at splice intersections. Lap Sealant is applied at flashing and tape overlaps in accordance with standard procedures.

3. When the repair membrane is Uncured TPO Flashing, the use of In-Seam Sealant is not required.

4. Extend the repair membrane section at least 3" in every direction from the cut or tear. Round the corners of the repair membrane prior to splicing.

C. SPLICE REPAIRS

1. **Repair of Improperly Installed Tape Seams**

   a. Improperly installed tape splices include, but are not limited to, fishmouths at field splices, lack of or improper use of Primer, condensation formation on primer or incorrect tape placement, etc.

   b. Clean the splice area with TPO Primer on both sides extending past the width of the new flashing overlay to be installed.

   c. Overlay the defective splice area with a minimum 6" wide Pressure Sensitive White Cured Cover Strip centered over the edge of the splice.

   d. **If fishmouths are present in the field splice**, the fishmouth must be cut by removing the top layer of membrane prior to overlaying the splice. The flashing overlay **must** be supported by the bottom layer of cured membrane.

REINFORCED MECHANICALLY-ATTACHED ROOFING SYSTEM

INSTALLATION DETAILS

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