**WeatherBond FLeece TPO**

 **Adhered**

 **Form-Spec**

 **January 2024**

**Note to the User:** Some text has been colored and underlined so the specifier can customize a specification for a specific project. This information must be edited by the specifier to create a final draft of the project specification.

**PART 1 GENERAL**

**1.01 DESCRIPTION**

A. The Project Name is located at Address in City and State. Name of Project Manager, Project Manager/Coordinator, is the Owner's Representative and may be contacted regarding any questions or for a pre-bid job site inspection, phone Phone Number.

B. The project consists of installing WeatherBond’s Fleece TPO white, gray or tan 100 or 115 or 135 membrane adhered with Flexible DASH Adhesive as outlined below:

(choose the appropriate paragraph and delete remainder)

Apply the WeatherBond Fleece TPO Adhered Roofing System in conjunction with Insulation Type over the new Deck Type roof deck.

 **OR**

Apply the WeatherBond Fleece TPO Adhered Roofing System directly to the new Deck Type roof deck.

 **OR**

Apply the WeatherBond Fleece TPO Adhered Roofing System in conjunction with Insulation Type over the existing Material Type roof.

 **OR**

Apply the WeatherBond Fleece TPO Adhered Roofing System directly to the existing Material Type roof.

 **OR**

Apply the WeatherBond Fleece TPO Adhered Roofing System in conjunction with Insulation Type after tear off of the existing Material Type roof to expose the Deck Type for verification of suitable substrate as specified in this specification.

**1.02 EXTENT OF WORK**

A. Provide all labor, materials, tools, equipment, and supervision necessary to complete the installation of the WeatherBond Fleece TPO Adhered Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.

B. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.

C. The roofing contractor shall confirm all given information and advise the building owner, prior to bid, of any conflicts that will affect their cost proposal.

D. Any contractor who intends to submit a bid using a roofing system other than the approved manufacturer must submit for pre-qualification in writing fourteen (14) days prior to the bid date. Any contractor who fails to submit all information as requested will be subject to rejection. Bids stating "as per plans and specs" will be unacceptable.

**1.03 SUBMITTALS**

A. Prior to starting work, the roofing contractor must submit the following:

1. Shop drawings showing layout, details of construction and identification of materials.

2. A sample of the manufacturer's Warranty.

3. Certification from the membrane manufacturer indicating the membrane thickness over the reinforcing scrim (top ply membrane thickness) is nominal .015-mil or thicker.

**1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.

B. Comply with the manufacturer's written instructions for proper material storage.

1. Store WeatherBond Fleece TPO membrane in a dry, cool, shaded area in the original undisturbed plastic. WeatherBond Fleece TPO membrane that has been exposed to the elements for approximately 7 days must be prepared with Weathered Membrane Cleaner prior to hot air welding.

2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.

3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.

C. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.

D. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

**1.05 WORK SEQUENCE**

A. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath or wick into any completed sections of the membrane system.

B. Do not disrupt activities in occupied spaces.

**1.06 USE OF THE PREMISES**

A. Before beginning work, the roofing contractor must secure approval from the building owner's representative for the following:

1. Areas permitted for personnel parking.
2. Access to the site.
3. Areas permitted for storage of materials and debris.

4. Areas permitted for the location of cranes, hoists and chutes for loading and unloading materials to and from the roof.

B. Interior stairs or elevators may not be used for removing debris or delivering materials, except as authorized by the building superintendent.

**1.07 EXISTING CONDITIONS**

If discrepancies are discovered between the existing conditions and those noted on the drawings, immediately notify the owner's representative by phone and solicit the manufacturer's approval prior to commencing with the work. Necessary steps shall be taken to make the building watertight until the discrepancies are resolved.

**1.08 PRECONSTRUCTION CONFERENCE**

A. A pre-bid meeting will be held at the job site on Date at Time. Contact the owner's representative, Name and Title, at Phone Number if there are any questions.

B. Prior to bid submittal, the roofing contractor should schedule a job site inspection to observe actual conditions and verify all dimensions on the roof. The job site inspection may occur on the day of the pre-bid meeting or prior to such a meeting. Should access to the roof be necessary before or after the pre-bid meeting, the contractor must contact the owner's representative, Name and Title, at Phone Number to coordinate an appropriate time.

C. Bids must be forwarded to the following address no later than Time on Date:

Name and Address

D. Any conditions which are not shown on the shop drawings should be indicated on a copy of the shop drawing and included with bid submittal if necessary to clarify any conditions not shown.

**1.09 TEMPORARY FACILITIES AND CONTROLS**

A. Temporary Utilities:

1. Water, power for construction purposes and lighting are/are not available at the site and will/will not be made available to the roofing contractor.

2. Provide all hoses, valves and connections for water from a source designated by the owner when made available.

3. When available, electrical power should be extended as required from the source. Provide all trailers, connections and fused disconnects.

1. Temporary, Sanitary Facilities

Sanitary facilities will not be available at the job site. The roofing contractor shall be responsible for the provision and maintenance of portable toilets or their equal.

1. Building Site:

1. The roofing contractor shall use reasonable care and responsibility to protect the building and site against damages. The contractor shall be responsible for the correction of any damage incurred as a result of the performance of the contract.

2. The roofing contractor shall remove all debris from the job site in a timely and legally acceptable manner so as to not detract from the aesthetics or the functions of the building.

D. Security:

Obey the owner's requirements for personnel identification, inspection and other security measures.

**1.10 JOB SITE PROTECTION**

A. The roofing contractor shall adequately protect building, paved areas, service drives, lawn, shrubs, trees, etc. from damage while performing the required work. Provide canvas, boards and sheet metal (properly secured) as necessary for protection and remove protection material at completion. The contractor shall repair or be responsible for costs to repair all property damaged during the roofing application.

B. During the roofing contractor's performance of the work, the building owner will continue to occupy the existing building. The contractor shall take precautions to prevent the spread of dust and debris, particularly where such material may sift into the building. The roofing contractor shall provide labor and materials to construct, maintain and remove necessary, temporary enclosures to prevent dust or debris in the construction area(s) from entering the remainder of the building.

C. Do not overload any portion of the building, by either use of or placement of equipment, storage of debris, or storage of materials.

D. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.

E. Take precautions to prevent drains from clogging during the roofing application. Remove debris at the completion of each day's work and clean drains, if required. At completion, test drains to ensure the system is free running and drains are watertight. Remove strainers and plug drains in areas where work is in progress. Install flags or other telltales on plugs. Remove plugs each night and screen drain.

F. Store moisture susceptible materials above ground and protect with waterproof coverings.

G. Remove all traces of piled bulk material and return the job site to its original condition upon completion of the work.

**1.11 SAFETY**

The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. **Safety shall be the responsibility of the roofing contractor.** All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site.

**1.12 WORKMANSHIP**

A. Applicators installing new roof, flashing and related work shall be factory trained and approved by the manufacturer they are representing.

B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.

C. There shall be a supervisor on the job site at all times while work is in progress.

**1.13 QUALITY ASSURANCE**

1. The WeatherBond Fleece TPO Membrane Roofing System must achieve a UL Class A, B or C.
2. (choose the appropriate paragraph and delete remainder)

The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to

ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies”

American Society of Civil Engineers (ASCE 7)

International Building Code (IBC)

and after multiplying the results with a safety factor of (determined by designing professional).

 **OR**

The specified roofing assembly must be rated by Factory Mutual Global (FMG) to meet or exceed the factored uplift pressures outlined in FMG Property Loss Prevention Data Sheet 1-28, and complies with FMG Property Loss Prevention Data Sheet 1-29 for enhancements at the perimeter and corners.

1. The membrane must be manufactured by the material supplier. Manufacturer’s supplying membrane made by others are not acceptable.
2. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
3. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.
4. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and an experienced superintendent on the job at all times roofing work is in progress.
5. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by written certification on manufacturer's letterhead and presented for the specifier's consideration.
6. The WeatherBond Fleece TPO White membrane meets CRRC (Cool Roof Rating Council) for reflectance and emittance.  When tested in accordance with ASTM C1549, the WeatherBond Fleece White TPO material has an initial solar reflectance of  0.79 and a 3-year aged reflectance of  0.70.  The material has also been tested for emittance in accordance with ASTM C1371; an initial emittance of .90 and a 3-year aged emittance of  0.86 were achieved.
7. The Fleece White TPO membrane meets the emittance requirements set forth by the USGBC (U. S. Green Building Council) for their LEED (Leadership in Energy and Environmental Design) Program.  The Fleece White TPO material has an emittance of  0.90  (when tested in accordance with ASTM E408) and an SRI (solar reflectance index) of 99 (calculated using ASTM E 1980).
8. The Fleece TPO Tan membrane meets CRRC (Cool Roof Rating Council) for reflectance and emittance.  When tested in accordance with ASTM C1549, the Fleece Tan TPO material has an initial solar reflectance of  0.71.  The material has also been tested for emittance in accordance with ASTM C1371; an initial emittance of  0.87 was achieved.
9. The Fleece Tan TPO membrane meets the emittance requirements set forth by the USGBC (U. S. Green Building Council) for their LEED (Leadership in Energy and Environmental Design) Program.  The Fleece Tan TPO material has an emittance of  0.86  (when tested in accordance with ASTM E408) and an SRI (solar reflectance index) of 86 (calculated using ASTM E 1980).
10. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.

**1.14 JOB CONDITIONS, CAUTIONS AND WARNINGS**

Refer to WeatherBond’s Fleece Adhered Roofing System specification for General Job Site Considerations.

1. Safety Data Sheets (SDS) must be on location at all times during the transportation, storage and application of materials.
2. **Do not apply Flexible DASH Adhesive** when surface and/or ambient temperatures are **below 25°F**.
3. The contractor must exercise caution during adhesive spraying to avoid overspray.

Use a non-atomizing spray tip such as the Graco Spatter Tip and reduce spray pressure to 500 – 800 psi to increase adhesive droplet size and reduce airborn mist. Maintain hand held wind screens on-site for use as necessary.

Extruding Flexible DASH Adhesive method may be used to eliminate overspray concerns.

1. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
2. When loading materials onto the roof, the roofing contractor must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
3. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
4. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
5. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
6. New roofing shall be complete and weather tight at the end of the work day. Care must be taken to avoid wicking water though the fleece by properly sealing exposed edges of the membrane
7. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

**PART 2 PRODUCTS**

**2.01 GENERAL**

A. All components of the specified roofing system shall be products of WeatherBond or accepted by WeatherBond as compatible.

B. Unless otherwise approved by the specifier and accepted by the membrane manufacturer, all products (including adhesives, insulation, fasteners, fastening plates and edgings) must be **manufactured and supplied** by the roofing system manufacturer and covered by the warranty.

* 1. **MEMBRANE**

**Note:** Special Color TPO **(**Medium Bronze, Rock Brown, Terra Cotta, Slate Gray and Patina Green) is available in 115-mil and 12’ wide x 100’ long membrane ONLY. Special Color Fleece TPO is available by special order and a lead time will be required.

1. Furnish 100-mil, 115-mil, or 135-mil WeatherBond Fleece TPO white, gray, tan or Special Color reinforced TPO (Thermoplastic Polyolefin) membrane. Membrane thickness over the reinforcing scrim (top-ply thickness) shall be nominal .015-mil or thicker.
2. Membrane Color: White top surface with SRI (solar reflectance index) not less than 110, tested in accordance with ASTM E 1980.
3. Membrane Weathering Performance: The TPO membrane shall be formulated with Octaguard XT Weathering Package to withstand 60 days of exposure at a 275° F temperature and a minimum of 17,000 kj/m2 xenon arc resistance at 80°F without cracking or showing signs of material failure, exceeding ASTM 6878.
4. White TPO Membrane Sheets are 6’ wide by 75’ or 100’ long, and 12’ wide by 50’, 75’ or 100’ long.
5. Gray or Tan Membrane Sheets are 12’ wide by 75’ or 100’ long.
6. Special Color TPO (Medium Bronze, Rock Brown, Terra Cotta, Slate Gray and Patina Green) Membrane Sheets are 12’ wide by 100’ long.

**2.03 INSULATION/UNDERLAYMENT**

1. When applicable, insulation shall be installed in multiple layers and mechanically fastened or secured with DASH Adhesive to the substrate in accordance with manufacturer's published specifications.
2. Insulation shall be Type of Insulation as supplied by WeatherBond. Minimum R-value required is Note R-Value.

(choose the appropriate paragraph and delete remainder)

1. **WeatherBond XP Polyiso** – A foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer meeting ASTM C 1289-06, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4’ x 8’ standard size with a thickness from 1 to 4 inches. 4’ x 4’ tapered panels are also available.
2. **WeatherBond XFP Polyisocyanurate–** A foam core insulation board covered on both sides with a coated glass fiber mat facer meeting ASTM C 1289-06, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4’ x 8’ standard size with a thickness from 1 to 4 inches. 4’ x 4’ tapered panels are also available.
3. **WeatherBond XFP HD Composite** – Composite insulation panel comprised of ½-inch high-density Polyiso cover board (100 psi) laminated during the manufacturing process to XFP rigid Polyiso roof insulation meeting ASTM C1289 Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). Available in 4’ x 8’ boards with thickness from 2” to 4.5”. 4’ x 4’ panels are also available.
4. **XP-NB Polyiso Composite (OSB) –** Polyiso insulation bonded on the bottom side with a medium weight fiber reinforced felt facer and laminated with a top surface of 7/16” or 5/8” thick Oriented Strand Board (OSB) meeting ASTM C 1289-06, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). Available in 4’ x 8’ boards with a thickness from 1-1/2” to 4”.
5. **WeatherBond XFP HD Cover Board–** a rigid insulation panel composed of a high-density, closed-cell polyisocyanurate foam core laminated to moisture resistant coated-glass fiber-mat facer for use as a cover board or recover board meeting ASTM 1289-06, Type II, Class 2 (100 psi). Available 1/2” thick 4’ x 8’ panel weight 11 lbs with an R-value of 2.5.
6. **WeatherBond XFP HD Plus** - a rigid insulation panel composed of a high-density (109 psi max), closed-cell polyisocyanurate foam core laminated to premium-performance coated-glass fiber-mat facer for use as a cover board or recover board. Available 1/2” thick 4’ x 8’ panel weight 11 lbs with an R-value of 2.5. Meets an FM 1-90 using only 8 fasteners per 4’ x 8’ board.
7. **InsulFoam I (EPS: Expanded Polystyrene) –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type I. Nominal density of 1.0 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from ¼” to 40”. Custom lengths, widths and tapered boards are available. Specified beneath Recovery Board, Dens-Deck Prime or Securock.
8. **InsulFoam VIII (EPS: Expanded Polystyrene) –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type VIII. Nominal density of 1.25 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from ¼” to 40”. Custom lengths, widths and tapered boards are available. Specified beneath Recovery Board, Dens-Deck Prime or Securock.
9. **InsulFoam II (EPS: Expanded Polystyrene) –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type II. Nominal density of 1.5 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from ¼” to 40”. Custom lengths, widths and tapered boards are available. Specified beneath Recovery Board, Dens-Deck Prime or Securock.
10. **InsulFoam IX (EPS: Expanded Polystyrene) –** A closed-cell lightweight expanded polystyrene (EPS) that meets ASTM C578, Type IX. Nominal density of 2.0 lbs/cubic ft (pcf) available in 4’ x 4’ or 4’ x 8’ sizes with thickness from ¼” to 40”. Custom lengths, widths and tapered boards are available. Specified beneath Recovery Board, Dens-Deck Prime or Securock.
11. **InsulFoam HD Composite –** InsulFoam expanded polystyrene (EPS) insulation laminated with a top surface of 1/2” thick XFP HD. Available in 4’ x 8’ boards with thickness from 1-1/2” to 7”.
12. **InsulLam –** InsulFoam expanded polystyrene (EPS) insulation laminated with a top surface of 1/2” Dens Deck Prime, 1/2” Securock, or 1/2" HP Recovery Board. Available in 4’ x 8’ boards with thickness from 1-1/2” to 7”.
13. **Dens Deck Prime** –gypsum core that incorporates glass-mat facings on the top and bottom side. The top surface is pre-primed and provides excellent bond strength for adhered membrane for use as a cover board. Available in ¼” to 5/8” and 4’ x 4’ or 4’ x 8’ size boards.
14. **DensDeck StormX Prime** – a reinforced gypsum cover board with an enhanced, moisture-resistant core and coated glass mat facers on the top and bottom side. The top surface is pre-primed and provides excellent bond strength for adhered membrane for use as a cover board. DensDeck StormX Prime is extremely durable and is approved for use in assemblies meeting FM’s Very Severe Hail (VSH) Classification. Available in 5/8” thickness and 4’ x 4’ or 4’ x 8’ size boards.
15. **Dens Deck Cover Board** –gypsum core that incorporates glass-mat facings on the top and bottom side for use as a cover board. Available in ¼” to 5/8” and 4’ x 4’ or 4’ x 8’ size boards.
16. **Securock Cover Board –** A uniform composition of fiber-reinforced with no facer for use as a cover board or a thermal barrier. Available in ¼” to 5/8” thick and 4’ x 4’ or 4’ x 8’ size boards. Long uninterrupted runs (>200’) may require slight gapping due to thermal expansion.
17. **Recovery Board** - A 1/2” or 1” thick high-density wood fiberboard with an asphalt coated facer for use as a cover board or recover board. Available ½” or 1” thick and 4’ x 4’ or 4’ x 8’ size boards.
	1. **FASTENING COMPONENTS**

To be used for mechanical attachment of insulation and to provide additional membrane securement:

(Delete the Fastener/Insulation Plate OR Adhesives which will not be used)

1. **Fasteners, Plates and Bars**
2. **HPW- Fasteners**: a threaded, #14 fastener with a #3 phillips drive used with steel and wood roof decks.
3. **HPWX Fasteners**: A heavy duty #15 threaded fastener with a #3 phillips drive used for membranre or insulation securement into steel, wood plank or minimum 15/32 inch thick plywood when increased pullout resistance is desired.
4. **HPW-XL Fastener:** an oversized diameter (.315) steel threaded fastener with a #3 phillips drive used in conjunction with HPW-XL Plates for membrane securemt into steel or wood decks.
5. **Pre-Assembled ASAP Fasteners:** A pre-assembled 3” diameter Plastic Plate and # 12 threaded fastener with a #3 drive used for insulation attachment into steel or wood decks. Installed using OMG Fastening Tools.
6. **InsulTite Fasteners:** A threaded #12 fastener with #3 phillips drive used for insulation attachment into steel or wood decks.
7. **CD-10 Fasteners**: A non-threaded, hammer driven fastener used with structural concrete roof decks rated 3,000 psi or greater.
8. **MP 14-10 Fasteners:** A #14 threaded fastener with a #3 phillips drive used for minimum 3,000 psi concrete decks.
9. **Polymer Gyptec Fasteners**: A non-penetrating, plastic fastener and corresponding 3” diameter plate used with lightweight deck substrates such as cementitious wood fiber, gypsum, and lightweight insulating concrete.
10. **Term Bar Nail-Ins**: A 1-1/4” long expansion anchor with a zinc plated steel drive pin used for fastening the Termination Bar or Seam Fastening Plates to concrete, brick, or block walls.
11. **HPWX Plates**: A 2-3/8” diameter metal barbed fastening plate used with HPWX or MP-14-10 Fasteners for membrane securement. This plate can be used for insulation securement.
12. **HPW-XL Plates:** A 2-3/8” diameter metal barbed fastening plate with an oversized hole for use with HPW-XL Fasteners for membrane securement.
13. **Insulation Fastening Plates**: a nominal 3 inch diameter plastic or metal plate used for insulation attachment.
14. **Insulation Adhesive:**

(choose the appropriate paragraph and delete remainder)

* 1. **Flexible DASH Adhesive:** A two component insulating urethane adhesive used to attach insulation and Fleece membrane. Packaging formats include 50 and 15 gallon drums as well as Dual Tanks, Dual Cartridges and 5 gallon Jug formats.

**2.05 ADHESIVES, CLEANERS AND SEALANTS**

All products shall be furnished by WeatherBond and specifically formulated for the intended purpose.

(Delete the Adhesive, Primer or Cleaner which will not be used)

1. **Flexible DASH Adhesive:** A two component insulating urethane adhesive used to attach insulation and Fleece membrane. Packaging formats include 50 and 15 gallon drums as well as Dual Tanks, Dual Cartridges and 5 gallon Jug formats.
2. **TPO Bonding Adhesive:** A high-strength, synthetic rubber adhesive used for bonding WeatherBond TPO membrane to various surfaces. The adhesive is applied to both the membrane and the substrate at a coverage rate of approximately 60 square feet per gallon per finished surface (includes coverage on both surfaces).
3. **Low VOC Bonding Adhesive for TPO:**  This product meets the <250 gpl VOC (volatile organic compound) content requirements of the OTC Model Rule for Single-Ply Roofing Adhesives. A high strength, solvent-based contact adhesive that allows bonding of TPO membrane to various porous and non-porous substrates. Apply at a rate of 60 ft2 per gallon finished surface. Available in 5 gallon pails. This product does not comply with southern California counties with additional restrictions on solvents.See Product Data Sheet for a listing of the counties involved.
4. **Low VOC Bonding Adhesive 1168:** This product meets the <250 gpl VOC (volatile organic compound) content requirements of the OTC Model Rule for Single Ply Roofing Adhesives. A high strength, solvent-based contact adhesive the allows bonding of TPO membrane to various porous and non-porous substrates. Apply at a rate of 60 ft2 per gallon finished surface. Available in 5-gallon cans. This product complies with southern California counties with additional restrictions on solvents. See Product Data Sheet for a listing of the counties involved.
5. **Aqua Base 120 Bonding Adhesive**: A semi pressure-sensitive, water based adhesive used as a two-sided contact adhesive. Coverage rate is 120 square feet per gallon finished surface (applied to membrane and substrate).
6. **CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer:** a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: bonding WeatherBond EPDM and TPO membranes to various surfaces, enhancing the bond between WeatherBond’s VapAir Seal 725TR and various substrates, and priming unexposed asphalt prior to applying Flexible DASH Adhesive. Coverage rate is approximately 2,000-2,500 sq. ft. per #40 cylinder and 4,000-5,000 sq. ft. per #85 cylinder as a primer, in a single-sided application and 750 sq. ft. per #40 cylinder and 1,500 sq. ft. per #85 cylinder as an adhesive for vertical walls, in a double-sided application.
7. **Cut-Edge Sealant:** A white or clear colored sealant used to seal cut edges of reinforced Fleece TPO membrane. A coverage rate of approximately 225 - 275 linear feet per squeeze bottle can be achieved when a 1/8" diameter bead is applied.
8. **Water Cut-Off Mastic:** Used as a mastic to prevent moisture migration at drains, compression terminations and beneath conventional metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon).
9. **Universal Single-Ply Sealant:** A 100% solids, solvent free, voc free, one part polyether sealant that provides a weather tight seal to a variety of building materials. It is white in color and is used for general caulking such as above termination bars and metal counter flashings and at scuppers.
10. **Thermoplastic One-Part Pourable Sealer**: A one-part, moisture curing, elastomeric polyether sealant used to fill TPO Molded Pourable Sealant Pockets. Packaged in 4, 2-liter foil pouches inside a reusable plastic bucket. 1 pouch will fill 2 TPO Molded Pourable Sealant Pockets.
11. **Weathered Membrane Cleaner:** Used to prepare membrane for heat welding that has been exposed to the elements or to remove general construction dirt at an approximate coverage rate of 400 square feet per gallon (one surface).
12. **TPO Primer:** A solvent-based primer used to prepare the surface of Fleece TPO Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS.
13. **TPO Low VOC Primer::** A solvent-based, low solids primer used to prepare the surface of Fleece TPO Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS. This low VOC product is ideal for use in states where environmental issues are a concern.

(choose the appropriate Primer and delete remainder)

1. CCW 702 Primer and 702LV Primer (Low VOC): A single component, solvent based, high-tack primer used to provide maximum adhesion between VapAir Seal 725TR Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 300 to 350 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., Dens-Deck Prime gypsum board). Available in 5-gallon containers. CCW 702LV Primer contains less than 250g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.
2. **CCW 702 WB:** a high-tack, water-based contact adhesive for promoting adhesion of air/vapor barrier membranes and an approved substrate (i.e., concrete, Dens-Deck Prime and Securock). Applied by roller, brush or spray with an application rate of approximately 200 sq. ft. per gallon. Available in 5-gallon containers. CCW 702 WB Primer contains 57g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.
3. **CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer:** a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: bonding WeatherBond EPDM and TPO membranes to various surfaces, enhancing the bond between WeatherBond’s VapAir Seal 725TR and various substrates, and priming unexposed asphalt prior to applying Flexible DASH Adhesive. Coverage rate is approximately 2,000-2,500 sq. ft. per #40 cylinder and 4,000-5,000 sq. ft. per #85 cylinder as a primer, in a single-sided application and 750 sq. ft. per #40 cylinder and 1,500 sq. ft. per #85 cylinder as an adhesive for vertical walls, in a double-sided application.

**2.06 METAL EDGING AND MEMBRANE TERMINATIONS**

(Choose the appropriate type of metal edging or membrane termination and delete the types which will not be used)

1. **General:** All metal edgings shall be tested and meet ANSI/SPRI ES-1 standards and comply with International Building Code.

(The products below have been grouped by suppliers and performance priority, as well as their code ratings. Make your selection and delete remainder.)

1. **(OMG Supplied -Remove name after selection)**
	1. **VersiTrim 300:** a coping or fascia, snap-on edge system consisting of a 24 gauge galvanized metal water dam and .050” or .063” thick Kynar 500, clear and colored anodized finish or 24 gauge steel, Kynar 500 finish. Metal fascia color shall be as designated by the Owner's Representative. ANSI/SPRI ES-1 Certified. Coping FM Approved 1-90 with 20 ga. Cleat, 1-180 with 16 ga. Cleat. Fascia FM Approved 1-225.
	2. **VersiTrim 3000:** a metal fascia system with a 20 gauge steel retainer bar and .032”, .040” or .050” thick aluminum or 24 gauge galvanized steel fascia. Metal fascia color shall be as designated by the Owner's Representative. ANSI/SPRI ES-1 Certified. 3000 Coping FM Approved 1-465 with .050 aluminum retainer, 1-180 with 20 ga. Steel retainer. 3000 XT Coping FM Approved 1-315.
2. **(Metal Era Supplied – Remove name after selection)**
3. **VersiTrim 200:** a coping or fascia, snap-on edge system consisting of a 24 gauge galvanized metal water dam and .040”, .050” or .063” thick Kynar 500, clear and colored anodized finish or 24 gauge steel, Kynar 500 finish. Metal fascia color shall be as designated by the Owner's Representative. ANSI/SPRI ES-1 Certified. Coping FM Approved 1-90. Fascia FM Approved 1-195.
4. **VersiTrim 2000**: a metal fascia system with an extruded aluminum anchor bar and .040” thick aluminum or 24 gauge galvanized steel fascia. Metal fascia color shall be as designated by the Owner's Representative. ANSI/SPRI ES-1 Certified. 2000 Fascia FM Approved 1-645. 2000 Extended Fascia FM Approved 1-270. 2000 Canted Fascia FM Approved 1-270.
5. **(Metal Era Supplied – Remove name after selction)( NO FM Rating Available)**
6. **VersiTrim One Fascia:** A snap-on edge system consisting of a 20 gauge retainer bar, corrosion resistant fasteners and a 24 gauge or 0.040 aluminum Kynar finished fascia cover. A spring clip holds the fascia cover in place. Available in sizes up to 8” fascia height 12’ long. Metal fascia color shall be designated by the Owner’s Representative. ANSI/SPRI ES-1 Certified.
7. **VersiTrim One Coping:** A snap-on coping edge system consisting of a 24 gauge retainer bar (face side only), corrosion resistant fasteners and a 24 gauge or 0.040 aluminum Kynar finished coping cover. The coping cover is secured by clipping on the retainer bar and fastened on the backside with corrosion resistant fasteners (with rubber washer). Available for wall thicknesses up to 30”. Metal coping cap color shall be as designated by the Owner's Representative. ANSI/SPRI ES-1 Certified.
8. **Drip Edge**: a metal fascia/edge system with a 22 or 24 gauge continuous anchor cleat and .032 inch thick aluminum or 24 gauge steel fascia. Metal fascia color shall be as designated by the Owner's Representative.
9. **VersiTrim Coping**: incorporates a 20 gauge anchor cleat with 4 pre-slotted holes, a concealed joint cover and 10 foot continuous sections of coping cap; can accommodate minimum 5 “ wide parapet walls. Metal coping cap color shall be as designated by the Owner's Representative.
10. **Termination Bar**: a 1” wide and .098” thick extruded aluminum bar pre-punched 6” on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.
11. **VersiTrim Term Bar Fascia:** A 1.75” wide formed aluminum termination bar with pre-slotted fastening holes for ease of locating and installing. The decorative cover is available in 0.040” aluminum or 24-gauge galvanized steel. VersiTrim Term Bar Fascia is manufactured in 12’ lengths for fewer joints/seams, fewer sections to handle and faster installation.

**2.07 WALKWAYS**

Protective surfacing for roof traffic shall be Fleece TPO Walkway Rolls installed per manufacturer’s requirements or concrete pavers loose laid over an approved slip sheet (pavers not recommended for slopes greater than 2” in 12”).

**2.08 OTHER MATERIALS**

1. **VapAir Seal 725TR Air & Vapor Barrier / Temporary Roof:** 725TR is a 40-mil composite consisting of 35-mils of self-adhering rubberized asphalt factory laminated to a 5-mil polyethylene film with an adhesion textured surface. 725TR roll dimensions are 39” x 100’ and the product is applied after priming an acceptable substrate with CCW 702, 702-LV or CAV-GRIP III primer.
2. **VapAir Seal MD Air and Vapor Barrier:** a reinforced composite aluminum foil with self-adhesive SBS backing and removable poly release film. Used for direct application over metal decks. Available in rolls 42.5" wide by 131.23” long (460 square feet).
3. **TPO Rib Profile:** Used to obtain the appearance of standing seam metal roofing with the performance of a TPO single-ply membrane. The Rib Profile measures 1-1/4” tall and 2-1/8” wide, including the welding flanges, while the vertical profile is a substantial 3/8” thick. The profile has a continuous 1/8” diameter alignment hole, for use with fiberglass connecting pins, as well as a 1/8” fiberglass reinforcing cord for added strength. The Rib Profile is available in white, gray and tan, 10’ lengths and packaged 20 per carton.
4. (Metal Flashing, if required, and miscellaneous items needed to fulfill the project requirements)

## PART 3 EXECUTION

**3.01 GENERAL**

A. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, job site considerations and weather restrictions.

B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

**3.02 VAPOR RETARDERS**

1. **General:**

 The use of a vapor retarder to protect insulation and reduce moisture accumula­tion within an insulated roofing assembly should be investigated, especially on projects with high interior humidity, such as, swimming pools, breweries, pulp mills, etc.

1. In the generally temperate climate of the United States, during the winter months, water vapor flows upward from a heated, more humid interior toward a colder, drier exterior. Vapor retarders are more commonly required in northern climates than in southern regions, where downward vapor pressure may be expected and the roofing membrane itself becomes the vapor retarder.
2. On cold storage/freezer facilities, the perimeter details must be selected to provide an air seal and prevent outside air from infiltrating and condensing within the roofing assembly.
3. Consult the latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association) for specific information.
4. If insulation is to be adhered to the vapor retarder with Flexible DASH Adhesive, the 725 TR vapor retarder must be compatible and shall be fully adhered to the substrate. Available products include WeatheerBond supplied “peel and stick” rubberized asphalt membrane with compatible film coating (VapAir Seal 725TR Air and Vapor Barrier), and spray or roller applied butyl coatings. Installation requirements for 725 Air and Vapor Barrier are identified in published specification.
5. **VapAir Seal 725TR Installation:**
6. **Surface Preparation**: Concrete shall be in place for 7 days minimum and the substrate must be dry. The surface shall have a smooth finish and be free of voids, spalled areas, sharp protrusions, loose aggregate, latence and form release agents. In the event of rain, concrete must be allowed to dry before primer is applied.
7. **Primer**: Surfaces to receive VapAir Seal 725TR Air and Vapor Barrier must be clean and dry. Prime with CCW 702 or 702LV or CAV-GRIP III Primer. Apply Primer by spray, brush or with a long nap roller at the applicable coverage rate noted above. At 75° F allow primer to dry 1 hour minimum. Primer has a satisfactory cure when it will not transfer when touched. Prime only areas to be waterproofed the same day. Re-prime if area becomes dirty.
8. **Application**: Apply VapAir Seal 725TR Air and Vapor Barrier from low to high point, in a shingle fashion, so that laps will shed water. Overlap all edges at lease 2-1/2". End laps shall be staggered. Place membrane carefully so as to avoid wrinkles and fishmouths. Immediately after installation, roll with a 150 pound segmented steel roller.
9. **Insulation Installation:** Ensure surface of VapAir Seal 725TR Air and Vapor Barrier is dry prior to installing insulation. Place insulation over the surface and mechanically fasten to the roof deck or adhere to the vapor barrier with Flexible DASH Adhesive in accordance with this Specification.
10. **Installation at angle changes**: For Fleece Systems where insulation is adhered to the vapor retarder, one of the following options must be incorporated to ensure continuous seal is provided during climatic changes, especially in northern regions:
11. Option One: Mechanically secure the first course of insulation (bottom layer) with insulation fasteners and plates. A row of fasteners shall be installed within 6” of the angle change spaced 12” O.C.
12. Option Two: In lieu of fastening, install a 3” diameter backer rod along the angle change to accommodate for movement and prevent the effect of the vapor retarder pulling away from angle change.

**Note:** Maintain mylar backing at the sponge tubing to prevent the 725TR from adhering to the tubing. As shown in the applicable detail.

1. Option Three: In lieu of fastening and when the use of backer rod is not possible, the 725TR can be installed with a double fold, allowing extra material to accommodate for structural movement.

**Note:** Maintain mylar backing within the fold to allow for material expansion in the event of movement. Refer to applicable detail.

1. For metal decks, VapAir Seal MD Air and Vapor Barrier is specifically designed for direct application to fluted steel decks. It may also be used in conjunction with either CAV-GRIP II on vertical wall surfaces, such as structural concrete, gypsum, Securock, DensDeck Prime, DensDeck StormX Prime and plywood substrates.
2. **VapAir Seal MD Installation:**
3. **Surface Preparation**: The surface shall have a smooth finish and be free of voids, spalled areas, sharp protrusions, loose aggregate, laitance and form release agents. In the event of rain, concrete must be allowed to dry before primer is applied.
4. **Primer**: Surfaces to receive VapAir Seal MD Air and Vapor Barrier must be clean and dry. Prime with CCW 702 or 702LV or CAV-GRIP III Primer. Apply Primer by spray, brush or with a long nap roller at the applicable coverage rate noted above. At 75° F allow primer to dry 1 hour minimum. Primer has a satisfactory cure when it will not transfer when touched. Prime only areas to be waterproofed the same day. Re-prime if area becomes dirty.
5. **Application**: Apply VapAir Seal MD Air and Vapor Barrier to the metal deck from low to high point, in a shingle fashion, so that laps will shed water. Overlap all edges at lease 2-1/2". End laps shall be staggered. Place either a 6” wide section of 24 gauge sheet metal or a 6” wide section of VapAir Seal MD directly on the metal under each end lap, perpendicular to the end lap, to ensure a solid surface to roll the end lap together. Seams and end laps must be rolled with a 2” seam roller or stand-up seam roller. Place membrane carefully so as to avoid wrinkles and fish mouths. Immediately after installation, broom the sheet to ensure proper contact to the metal.
6. **Insulation Installation:** Ensure surface of VapAir Seal MD Air and Vapor Barrier is dry prior to installing insulation. Place insulation over the surface and mechanically fasten to the roof deck accordance with this Specification.

**3.03 INSULATION PLACEMENT**

A. Install insulation or membrane underlayment over the substrate with boards butted together. Fill joints or gaps greater than 1/4 inch with Flexible DASH Adhesive. Stagger joints both horizontally and vertically if multiple layers are provided.

B. Secure insulation to the substrate with Flexible DASH Adhesive or mechanical fasteners in accordance with the manufacturer's specifications.

**3.04 MEMBRANE PLACEMENT AND BONDING**

1. Position and unroll successive sheets and align to provide a minimum 2 inch overlap (use pre-marked overlap line) along the selvage edge. At end laps (along the width of the sheet), membrane shall be butted together which will be overlaid with 6 inch wide Fleece TPO Reinforced Membrane and hot air welded on all edges.
2. Fleece Membrane shall be fully adhered to an acceptable substrate with Flexible DASH Adhesive. The adhesive is spray applied or extruded to the substrate only and the membrane is rolled into the wet adhesive once it has foamed up and reached string/gel time (approximately 2 minutes). Roll the membrane with a 150 pound segmented steel roller to set the membrane into the adhesive.

**Note:** Exercise care to prevent overspray onto the membrane. If Flexible DASH Adhesive should contaminate the splice area, immediately (while the adhesive is still in liquid form) clean with Weathered Membrane Cleaner or allow Flexible DASH Adhesive to cure and remove with a paint-type scraper**.**

1. Position adjoining sheets to allow a minimum overlap of 2 inches to provide a minimum 1-1/2” hot air weld.
2. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches and complete the bonding procedures as stated previously.

**3.05 MEMBRANE HOT AIR WELDING PROCEDURES**

A. **General**

The Fleece membrane has a selvage edge (the fleece-backing is discontinued) along the length of the sheet for membrane splicing. Selvage edges are not provided along the width of the membrane; adjoining membrane sheets must be butted together and overlaid with 6 inch wide Fleece TPO Reinforced membrane heat welded on all sides.

B. **Hot Air Welding Procedures**

1. Hot air weld the Fleece TPO membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam.

 Note: When using 115-mil thick or thicker membrane, all splice intersections shall be overlaid with TPO T-Joint covers or non-reinforced flashing

1. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
2. Repair all seam deficiencies the same day they are discovered.
3. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required on vertical splices.

**3.06 FLASHING**

A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Fleece TPO membrane. TPO non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of pre-molded accessories is not feasible.

1. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

(**Note:** When specifiying Rib Profile use installation procedure below.)

1. **TPO Rib Profile Installation**

(**Note:** The Rib Profile is recommended for use with Fleece adhered roofing systems.)

* 1. The TPO Rib Profiles should be positioned parallel to the laps of the installed TPO roofing system and parallel with the roof slope where possible.

* 1. Ensure that all welding surfaces are clean and dry. Inspect all seam areas for proper weld prior to installation.
	2. Set spacing according to project drawings.
	3. Connecting multiple ribs is achieved by using fiberglass pins. Insert a pin half-way into the end of one profile. Connect the adjoining rib by inserting the exposed end of the pin into the alignment hole. Repeat previous steps for additional TPO Rib profiles.
	4. Consult the TPO Rib Profile installation guides for instructions on proper welding installation techniques.
	5. **WALKWAYS**
1. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the specifier's drawing.
2. Hot air weld walkway pads to the membrane or install concrete pavers, loose laid over an approved protection sheet in accordance with the manufacturer's specifications.

Note: Pavers are not recommended when the roof slope exceeds 2 inches in 12 inches

**3.08 DAILY SEAL**

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Use Flexible DASH Adhesive or other similar material in accordance with the manufacturer's requirements.

**3.09 CLEAN UP**

A. Perform daily clean up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

 **END OF SPECIFICATION**