July 1, 2007

IBRS FULLY ADHERED SPECIFICATION

GUIDE SPECIFICATION FOR THE INSTALLATION OF IB PVC SINGLE-PLY MEMBRANE IN A FULLY ADHERED SYSTEM

1.00 GENERAL CONDITIONS

1.01 Description

A. Scope: Install a Fully Adhered IB PVC Single-Ply Membrane with prefabricated flashings and other items to comprise a roofing system.

B. Related Work: The work includes, but is not necessarily limited to, the installation of:

1. Vapor Barrier
2. Insulation
3. Separation Sheet
4. Fasteners
5. Roof Membrane
6. Prefabricated Flashings for Protrusions of Pipes
7. Walkways and Decking Materials
8. Clad Metal/Edge Metal & Detail Metal
9. Sealants and Adhesives
10. Fire Barrier (Fire Sheet, DensDeck or Securock)
11. Vents & Vent Flashings (One-way & Two-way Vents)

C. Upon successful completion of the work, and depending on the chosen thickness of the IB PVC Single-Ply Membrane 50, 60, or 80 mil, the following warranties may be obtained:

1. Lifetime Residential Limited Material Warranty
2. Commercial Limited Material Warranty (10, 15, 20 or 25 years)

3. Commercial Limited Labor and Material Warranty* (10, 15, 20 or 25 years)

4. Commercial Limited Labor and Material NDL Warranty* (10, 15, 20 or 25 years)

*Labor Warranty by Installer (2 years)

1.02 Quality Assurance

A. This roofing system shall be applied only by a contractor authorized by IBRS prior to bid.

B. The roofing membrane shall be a product of a manufacturer having over 20 years of experience in the manufacturing of roofing membrane.

C. Upon completion of the roofing project, the roofing contractor shall submit, to IBRS, a Request for Inspection Form or Notice of Completion Form, certifying that all work has been done in accordance with the contract specification and IBRS requirements. If a Manufacturer's Labor & Material Warranty or NDL Warranty was requested, and inspection shall be made by a representative of IBRS, to observe the roofing system.

D. There shall be no deviation made from the contract specification or the approved shop drawings without prior written approval from the owner and IBRS. If any items are found to be deficient and cannot be corrected at the time of inspection a punch list will be made and sent to the roofing contractor for correction. Upon completion of the punch list items, the roofing contractor will inform IBRS in writing.

1.03 Code Requirements

A. The roofing contractor is responsible for installing a system that will meet local building codes or one of the following recognized code approval or testing agencies.

1. International Code Council

2. Factory Mutual Research Laboratories

3. Florida Building Code

4. Miami-Dade County Building Code

5. Underwriter Laboratories

Note: If the referenced manufacturers guidelines and local codes or industry standards are in conflict, the more restrictive shall govern.

1.04 Submittals

A. The roofing contractor shall submit to the owner's representative the following:

1. Copies of specifications.

2. Written approval by the insulation manufacturer (as applicable) for use and performance of the product in the proposed system.

3. Specimen copy of IBRS warranty.

4. Copies of IBRS Product Data Sheets.

5. Copies of Material Safety Data Sheets (MSDS).

6. Dimensioned shop drawings, which should include:

   a. Outline of roof/s, dimensions & height of each building.

   b. Special details not in the IBRS Specification Manual, submit for approval (use the System/Detail Deviation Request Form).

   c. Technical acceptance from IBRS.

7. Certifications by producers of roofing materials that all materials supplied comply with all requirements of the identified ASTM and industry standards.

8. Certification that the system specified meets all identified code and insurance requirements.

B. The roofing contractor shall submit to IBRS Technical Department:

1. For an Labor and Material or NDL Warranty a completed Notice of Award, Roof Plan and non IBRS details prior to starting the project for technical approval.

2. For a Material Warranty, the Commercial Material Request form is the only form required to submit to IBRS.

1.05 Product Delivery, Storage, and Handling

A. All products delivered to the job site shall be in the original unopened containers or wrappings.

B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture. (Do not lay materials directly on existing roofing).

C. Membrane rolls shall be stored lying down on pallets and fully protected from moisture.

D. Bonding adhesives shall be stored at temperatures above 40 degrees F.

E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on container or supplied by IBRS.

1.06 Job Conditions

A. Only install as much new roofing and flashings as can be made watertight each day.

B. All roofing shall be completed without exposing the building interior, its contents, or employees to inclement weather. Relative to the roofing project, the roofing contractor assumes all responsibility for maintaining the building in a dry condition during the project.

C. All surfaces to receive new insulation, membrane, or flashings shall be thoroughly dry. If surface moisture occurs, the roofing contractor shall provide the necessary equipment to dry the surface prior to installation.

D. IBRS requires the owner's representative or the roofing contractor to run pullout tests of fasteners to verify condition of deck/substrate, and to confirm pullout values.

E. Temporary water stops shall be installed at the end of each work day, and shall be removed before proceeding with the next day's work.

F. The roofing contractor is cautioned that certain PVC membranes are incompatible with asphalt and oil-based materials and cements. Creosote and penta-based materials are also incompatible. Such materials should not come into contact with IB membranes at any time. If such contacts occur, the material shall be cut out and discarded. The roofing contractor should consult IBRS with respect to material compatibility, precautions, and recommendations.

G. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Where such access is absolutely required, the roofing contractor shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas.

H. Prior to and during application, all dirt, debris, and dust shall be removed from surfaces by vacuuming, sweeping, blowing with compressed air, and/or similar methods.

I. All new and existing roofing, insulation, flashings, adhesive cans, metal work, and general construction debris shall be properly disposed of following all applicable local, state, and federal regulations.

J. The roofing contractor shall follow all safety regulations as recommended by OSHA.(Occupational Safety & Health Administration).

K. The roofing contractor should take care during application and storage that overloading of the deck and structure does not occur.

L. Installation of IB PVC Single-Ply Membrane over coal tar pitch may require special installation precautions and techniques. Consult IBRS for such additional information.

M. Liquid materials such as solvents and adhesives shall be stored and used away from open flames, sparks, and excessive heat.

N. Until the roofing is completed, contaminants, such as grease, fats, oils, and solvents, should not be allowed to come into contact with the IB roofing membrane.

O. The roofing contractor shall verify that all roof drain lines are unblocked before starting work. Report any such blockages to the owner's representative and IBRS in writing.

P. If any unusual or concealed condition is discovered stop work and notify the owner and IBRS immediately in writing.

Q. All areas affected by construction activities shall be cleaned.

R. The roofing contractor should take necessary precautions when using IBRS adhesives around air intakes. The smell of the adhesive could be a disturbance to the building occupants. It is the responsibility of the roofing contractor to coordinate equipment to be turned off and on, with the owner, if necessary to avoid such an occurrence.

S. The degree to which the roof deck allows for air infiltration into the roof assembly may add to uplift forces on the roof system. Contact IBRS for recommendations about buildings with large openings.

1.07 Bidding Requirements

Bidders need to visit the site and carefully examine any areas in question as to conditions that could possibly affect proper execution of the work. All dimensions and quantities shall be determined or verified by the roofing contractor.

1.08 Warranties

A. Lifetime Residential Limited Material Warranty:

B. Commercial Limited Material Warranty: 10, 15, 20 or 25 year warranties are available at no charge to the owner.

C. Commercial Limited Labor and Material Warranty*: The manufacturer will warranty the IBRS material, plus the labor for the reinstallation of new materials if the material becomes defective and leaks. These warranties may be issued on a fee basis for a period of 10, 15, 20 or 25 years.

D. Commercial Limited Labor and Material NDL Warranty*: The manufacturer will warranty the IBRS material, plus the labor for the reinstallation of new materials if the material becomes defective and leaks and the contactors workmanship. These warranties may be issued on a fee basis for a period of 10, 15, 20 or 25 years.

*The Roof Contractor will be responsible for (workmanship) labor for the first two years after roof completion.

2.00 PRODUCTS

2.01 General

A. The roofing membrane manufacturer shall have over 20 years experience in producing PVC Single-Ply Membrane.

B. Any components other than those supplied or manufactured by IBRS must be submitted for review and acceptance.

2.02 Approved Membrane

A. IB PVC Single-Ply 50, 60, or 80 mil nominal thicknesses, polyester-reinforced membrane.

B. Even thickness Top and Bottom film.

C. Acrylic Top Finish.

D. IB PVC Single-Ply Membrane shall conform to ASTM D4434 - 96 Standard for polyvinyl chloride sheet roofing. Classification: Type 3.

E. Membrane Colors White (Solarwise), Tan, Gray, ChemGuard (White Solarwise), Red, Brown, and Evergreen. Custom colors can be manufactured, minimum order 300 squares.

F. IB PVC white (Solarwise) Single-Ply Membrane shall meet or exceed the below rating from Cool Roof Rating Council (CRRC) and is an Energy Star rated product.

CRRC Rating			
Solar Reflectivity		Thermal Emittance	
Initial	3 year	Initial	3 year
0.87	0.74	0.88	0.89

G. Sheet size:

1. 50 mil 6 X 90 (540 square feet)

2. 60 mil 6 X 90 (540 square feet)

3. 80 mil 6 X 60 (360 square feet)

H. As manufactured, the membrane shall conform to the physical properties noted on the following page.

IB PVC Roofing Membranes: Typical Properties

Property	Method	Requirement	50 Mil	60 mil	80 mil
Thickness [in]	ASTM D751	0.045	0.05 (+/- 10%)	0.06 (+/-10%)	0.080 (+/- 10%)
Breaking Strength [lbf/in.]					
MD	ASTM D751	200	370	465	540
XMD	A-Grab Method	200	310	400	480
Elongation @ Break [%]					
MD	ASTM D751	15[A]	40	40	40
XMD	A-Grab Method	15[A]	38	38	38
Retention of Properties after Heat Ageing:					
Breaking Strength **[%]**	ASTM D3045	90%	Pass	Pass	Pass
Elongation @ Break **[%]**	80□C for 56 days	Original	Pass	Pass	Pass
Tearing Strength **[%]**			Pass	Pass	Pass
Tearing Strength [lbf]	ASTM D751				
MD	B-Tongue Tear	45	72	73	74
XMD	Method	45	49	60	70
Low Temperature Bend [□C]	ASTM D2136 -40□C	Pass	Pass	Pass	Pass
Accelerated Weathering					
Cracking (7x Magnification)	ASTM G53	None	None	None	None
Crazing (7x Magnification)	5,000 h min	None	None	None	None
Discoloration (Visual)		Negligible	Negligible	Negligible	Negligible
Linear Dimensional Change[%]	ASTM D1204				
MD	80□C for 56 days	0.5	-0.4	-0.4	-0.4
XMD	for 6 hours	0.5	0.0	0.0	0.0
Change in Weight After Immersion in Water [%]	ASTM D570 70□C for 168 hours	3	1.5	1.2	1.2
Static Puncture Resistance	ASTM D5602 33 lbf @ 23□C	Pass	Pass	Pass	Pass
Dynamic Puncture Resistance	ASTM 5635 20J @ 23□C	Pass	Pass	Pass	Pass
Seam Strength	D751	75%	100%	100%	100%
Warranty (years non-prorated)			15 Material	20 Material	25 Material

A For reinforcing fabric only; elongation of PVC material shall be 250% MD and 220% XMD

The table presents typical properties of IB PVC roofing membranes. Requirements are taken from ASTM D4434-96.

Note: As well as ASTM D4434-96, IB PVC roofing membranes meet the following standards:

1. 1.Factory Mutual 4470
2. UL/ULC Class A
3. CAN/CGSB 37.54-95

2.03 Acceptable Substrates

A. Insulations:

1. Polyisocyanurate

a. IB ISO Energy Board

b. Any IBRS approved Polyisocyanurate

B. Cover Board

1. DensDeck

2. Securock

C. Structural Concrete with Steel Trowel Finish

D. Cellular Concrete with Smooth Darby Finish

E. Plywood-CDX or better for vertical surfaces

F. OSB for vertical surfaces

2.04 Acceptable Structural Decks

A. Structural Concrete

B. Lightweight Concrete

C. Structural Steel Types B & F (22 gauge or heavier)

D. Structural Steel Type A (24-26 gauge steel)

E. Poured or Panelized Gypsum

F. Cementitious Wood Fiber (Tectum etc.)

G. Plywood, ½" minimum

H. OSB, 5/8" minimum

I. Ship-lap 1" minimum or Tongue & Groove (T & G)

Acceptable Fasteners Table	Standard Insulation Fastener	Heavy Duty Membrane Fastener	Extra Heavy Duty Membrane Fastener	CD-10	Fluted Nail	NTB Fastener
Structural Concrete		●		●	●	
Lightweight Concrete						●
Structural Steel Types B & F	●	●	●			
Structural Steel Types A			●			
Poured or Panelized Gypsum						●
Cementitious Wood Fiber						●
Plywood ½"	●	●	●			
OSB 5/8"	●		●			
Ship-lap	●	●	●			
T & G (Tongue & Groove)	●	●	●			

It is the roofing contractor's responsibility to verify pullout values before roofing installation begins.

2.05 Related Materials

A. Wood nailers

1. Wood nailers should be treated for fire and rot resistance, #2 or better lumber. Creosote or asphaltic-treated lumber is not acceptable.

2. Wood nailers shall conform to Factory Mutual's Loss Prevention Data Sheet 1-49.

3. All wood shall have a maximum moisture content of 19% by weight on a dry weight basis.

B. Insulation

1. Polyisocyanurate

2. Expanded Polystyrene 1.5 lb/cubic foot minimum. (Overlay with a cover board or Poly ISO).

C. Insulation attachment

1. Fasteners and 3" plates shall be Factory Mutual approved and meet FM Standard 4470 for corrosion resistance.
Note: IBRS does not accept plastic plates.

2. Insulation Adhesive

Insulation Adhesive	Coverage Rate
OlyBond 500 Spot Shot	400-600sf/case
Tite-Set	2000sf/set
Insta-Stik	700-800sf/unit
IBond	1200sf/case

3. Hot Asphalt Attachment (verify with asphalt manufacturers Factory Mutual codes and approvals).

D. Membrane Adhesive

The adhesive for bonding the IB membrane to acceptable substrates shall be as follows:

1. IB Water Borne Adhesive for bonding IB membranes to the following acceptable substrates.

Substrate	Coverage Rate
Smooth Structural Concrete	175 sf / gal
Smooth Cellular Concrete	175 sf / gal
Smooth Plywood	150 sf / gal
Glass Faced Poly ISO	175 sf /gal
DensDeck Primed	200 sf / gal
Securock	200 sf / gal

2. IB membranes must be rolled into the adhesive while it is still wet.

E. Fire Barrier

The following separation fire barrier is acceptable under insulation to obtain a UL Fire Rated System:

1. DensDeck or Securock for use in conjunction with glass faced Poly ISO insulation.

2. ¼" or ½" DensDeck or Securock over non-combustible substrates. Note: Refer to the Approvals & Ratings section of the binder, for UL approved assemblies.

F. Sealants and Pitch Pan Fillers

1. The following caulking/sealants are acceptable to use with the IB PVC Single-Ply Membrane:

   a. IB Polyurethane Caulking

   b. IB Water Stop

   c. IB Pitch Pan Filler

G. Miscellaneous Fasteners and Anchors
All fasteners shall be the same type as the metal being secured. In general, all fasteners, anchors, nails, and straps shall be of zinc or cadmium plated steel, galvanized, or stainless steel. All fasteners and anchors shall have a minimum embedment of 1" into the acceptable substrate and shall be approved for such use by the fastener manufacturer. Fasteners for attachment of metal to wood blocking should be angular ring shank nails with 1" minimum penetration. Fasteners for attachment of metal to masonry should be expansion type fasteners. All fasteners shall meet Factory Mutual Standard 4470 for corrosion resistance.

3.00 EXECUTION

3.01 General

A. The roofing contractor has inspected and found the substrate suitable for the installation of the IB PVC membrane system.

B. The roofing contactor should coordinate the installation so that each area is made watertight at the end of the day.

3.02 Deck Preparation

The roof deck and existing roof construction must be structurally sound to provide support for the new roof system. If insulation is being fastened to the substrate, IBRS requires fastener pullout tests to verify deck condition and fastener pullout values.

A. New construction

1. Steel deck: The roof deck construction shall conform to Factory Mutual's recommendations outlined in their Loss Prevention Data Sheet 1-28.

2. Wood deck: The roof deck shall be a minimum nominal 1 ½" for lumber and 1/2" for plywood. The decks shall conform to Factory Mutual's requirements for Class 1 impregnated decks. Deck shall be installed according to Factory Mutual and/or local code requirements.

3. Poured structural, lightweight concrete or precast concrete deck: The roof deck shall be cured and dry to industry standards, and the surface shall be smooth, level, and free from moisture or frost. Sharp ridges or other projections above the surface shall be removed before roofing. On precast concrete decks all joints shall be grouted. Applying a lightweight fill over the entire deck or a grout applied over the joints and feathering out to create a smooth transition must correct differentials in deck elevation of more than ¼".

4. Cementitious wood fiber deck: The surface shall be smooth, level, and free from moisture or frost.

5. Gypsum concrete deck: The roof deck shall be cured and dry to the deck manufacturers and/or industry standards. The surface of the deck shall be smooth and free from ridges and depressions.

B. Re-roofing with removal of existing roofing

1. General criteria: All existing roofing, base flashing, deteriorated wood blocking, or deteriorated metal flashings shall be removed. Remove only that amount of roofing and flashing that can be made watertight with new materials during a one-day period or onset of inclement weather.

2. Steel deck: All rusted or deteriorated decking shall be brought to the attention of the owner's representative to determine acceptance and treatment or replacement. All rusted metal shall be treated with rust-inhibiting paint. Sections that have rusted through shall be completely removed and replaced. The use and type of steel roof deck construction shall conform to Factory Mutual's recommendations as outlined in their Loss Prevention Data Sheet 1-28.

3. Wood deck: All rotted and deteriorated wood shall be completely removed and replaced. The deck thickness shall be a minimum nominal 1 1/2" for lumber and 1/2" for plywood. The deck shall conform to Factory Mutual's requirements for Class 1 impregnated lumber decks. The deck shall be installed according to Factory Mutual and/or local code requirements.

4. Poured structural, lightweight concrete or precast concrete deck: The surface shall be level and free from moisture or frost. Sharp ridges, other projections, and accumulations of bitumen above the surface shall be removed to ensure a smooth surface before roofing. Any deteriorated decking shall be cut out and patched. On precast concrete decks all joints shall be grouted. Differentials in the deck elevation of more than ¼" must be corrected by applying a lightweight fill over the entire deck, or a grout applied over the joints and feathered out to create a smooth transition.

5. Cementitious wood fiber deck: The surface shall be smooth, level, and all wet and (or) deteriorated sections of decking shall be completely removed and replaced.

6. Gypsum concrete deck: All saturated and deteriorated gypsum shall be completely removed and replaced. All accumulations of bitumen shall be removed and the surface of the deck shall be smooth and free from ridges and depressions.

C. Re-roofing over existing roofing

Specifier and/or the roofing contractor shall determine the condition of the existing roof deck and roofing. Areas with deteriorated decking or wet materials are to be removed and replaced.

1. On graveled surfaces, remove all loose gravel and debris by power brooming or vacuuming.

2. Scratch and remove accumulations of bitumen or other irregularities to produce a relatively smooth surface. Remove and replace any areas that have wet insulation, deteriorated roofing or deck.

3. Cut and seal all blisters with compatible sealer.

3.03 Substrate Preparation

A. A proper substrate shall be provided to receive the IB PVC Single-Ply Membrane and Fully Adhered system.

B. The roofing contractor shall inspect the substrate for defects, such as, excessive surface roughness, contaminated surfaces, structurally unsound substrates, and anything that will adversely affect the quality of work.

C. The substrate shall be clean, smooth, dry, and free from flaws, sharp edges, loose and foreign material, oil, and grease. Roofing shall not start until all defects have been corrected.

D. All roof surfaces shall be free from water, ice, or snow.

E. The IB PVC Single-Ply Membrane shall be directly applied over compatible and acceptable substrates only.

3.04 Wood Nailers

A. Install continuous treated wood nailers at the perimeter of the entire roof and around roof projections and penetrations as specified on project drawings.

B. Nailers shall be anchored to resist a minimum force of 175 pounds per lineal foot in any direction. Fastener spacing shall be a maximum of 3’ O.C. Fasteners shall be installed within 6” of each end. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.

C. Thickness shall be as required to match substrate or insulation height.

D. Any existing woodwork that is to be reused shall be firmly anchored in place (it shall resist a minimum force of 175 pounds per lineal foot in any direction) and free from rot. Only woodwork designated to be reused in detail drawings shall be left in place, all other woodwork shall be removed.

3.05 Vapor Barrier Installation

A. General criteria
Interior and/or exterior conditions (inside temperature/relative humidity) may warrant the use of a vapor barrier. The design professional shall, based upon

information supplied by the owner, decide whether or not a vapor barrier is necessary. It is the design professional's responsibility to determine the type and location of a vapor barrier. A vapor barrier can also act as an overpressure barrier should interior air pressure be a concern. IBRS requires the use of an acceptable vapor barrier/overpressure barrier over non-monolithic decks (steel, wood, precast, etc.). In lieu of the vapor barrier/overpressure barrier, a double layer of insulation with staggered joints can be used. In a retrofit situation, the existing roofing is considered to be an adequate vapor barrier/overpressure barrier. Consult IBRS for special conditions such as cold storage freezers and high-humidity occupancies.

B. New construction
A vapor barrier shall be installed over suitable substrate (deck or insulation) with all side laps, end laps, and penetrations sealed in accordance with vapor barrier manufacturer instructions. The vapor barrier may be fastened or adhered with an adhesive supplied by the same manufacturer.

C. Re-roofing with removal of existing roofing
A vapor barrier shall be installed over suitable substrate (deck or insulation) with all side laps, end laps, and penetrations sealed in accordance with the vapor barrier manufacturer's instructions. The vapor barrier may be loosely laid, fastened, or adhered with an adhesive supplied by the same manufacturer.

D. Re-roofing over existing roofing
Under normal conditions the existing built-up roofing may be considered an adequate vapor barrier.

3.06 Insulation/Densdeck/Securock Installation

The prepared substrate shall be smooth, clean, dry and free of defects. The insulation shall be laid out on the substrate in parallel rows. All joints shall be staggered a minimum of 6" with no gaps larger than 1/8". If positive drainage is a requirement, tapered insulation should be considered.

A. Mechanical Attachment

1. IBRS requires pullout tests to be done to verify deck condition and actual pullout values.

2. Insulation shall be mechanically attached to the structural deck using corrosion-resistant screw and insulation plates, as supplied by IBRS. Fastening rate and pattern shall conform to insulation manufacturer, Factory Mutual, and IBRS recommendations.

3. Fasteners are to be installed in accordance with the fastener manufacturer's recommendations. Fasteners are to have minimum penetration into the structural deck recommended by the fastener manufacturer and IBRS.

4. Use fastener tools with a depth locator, as recommended or supplied by the fastener manufacturer, to ensure proper installation.

5. Insulation shall be laid on acceptable substrate or vapor barrier with tight joints in parallel courses with end joints staggered. If more than one layer is used, the second layer of insulation shall be laid transverse to the first layer with joints staggered.

6. Insulation shall be secured in accordance with Factory Mutual Technical Bulletin 1-28.

7. Install tapered insulation in accordance with the insulation manufacturer's shop drawings.

8. Install tapered insulation around drains to create a drain sump.

9. Do not install more insulation board than can be covered with IB membrane by the end of the day or onset of inclement weather.

10. Multi-Layer Insulation: If mechanically-attached, the first layer can be loose-laid, while the second layer would require mechanical attachment.

B. Insulation Adhesive:
Install Insulation Adhesive as per IBRS specification for smooth asphalt roofs, removing gravel asphalt roofs, concrete roofs and lightweight concrete roofs. (Coverage rate: See the chart in section 2.05 C)

1. The minimum product temperature prior to application should be between 70o F and 90o F. The minimum ambient and surface temperature should be above 40o F. For temperatures between 40o F and 0o F. Contact IBRS Technical Department.

2. Materials to be bonded should be clean, dry, and free of contaminates.

3. Insulation Adhesive is applied in rows a maximum of 12” o.c. The 4’ x 4’ insulation board is then laid into place and walked in to assure complete adhesion. Continuous walking in of the insulation board is not necessary. Boards are to be placed into the adhesive while it is still wet and tacky. Product becomes tack free within 4 to 8 minutes depending on ambient temperature

4. Insulation Adhesive contains ingredients which could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

5. IBRS maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your

employees and customers.

6. When Insulation Adhesive is stored indoors, out of direct sunlight, and in the original, unopened container between 45oF and 90oF. Protect from freezing.

7. Multi-Layer Insulation: The base layer must be adhered and fully secured, before the second layer can be adhered

C. Hot Asphalt Attachment:
Insulation shall be set into a continuous full mopping of Type III, hot steep asphalt, applied at a rate of 25-30 lbs. per square. Follow asphalt manufacturers installation procedures.

3.07 Fire Barrier Installation

If a UL fire rated system is required, one of the following barriers may be utilized.

A. DensDeck or Securock shall be laid out perpendicular to the insulation board. Stagger joints a minimum of 6".

B. It is the responsibility of the contractor to verify UL ratings before the roofing process begins.

3.08 Clad Metal Edge

A. All flashings shall be installed concurrently with the roof membrane as the job progresses.

B. Clad metal flashings shall be formed and installed per detail drawings.

C. Install clad metal and metal cleat in accordance with Factory Mutual's Loss Preventions Data Sheet 1-49.

D. Position the IB PVC Single-Ply Membrane over the roof edge and down the outside face of the wall or wood nailer. Fasten membrane 12" o.c. with galvanized roofing nails.

E. The fastening flange of the clad metal shall be a minimum of 2 ½" in width. Install fasteners a minimum fastener 1" from the outside edge of the clad metal so the 6" cover strip can be welded to the clad metal, completely covering all fasteners by a 1" minimum.

F. Clad metal shall be spaced ¼" apart. The joint shall be covered with 2" wide foil tape and then a 5" wide strip of flashing membrane shall be hot-air welded over the center of the joint.

G. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion/contraction.

H. Clad metal may be painted with exterior latex paint after roofing project is completed. Caution should be taken to prevent over spray of paint on roofing or building surfaces.

Note: All clad metal shall be IB 24 ga. clad metal (available in white only)

3.09 Installation of IB PVC Single-Ply Membrane

A. General

1. The surface of the insulation or substrate shall be inspected prior to installation of the IB PVC Single-Ply Membrane. The substrate shall be clean, dry, and smooth with no excessive surface roughness, contaminated surfaces, or unsound surfaces, such as broken or delaminated insulation boards.

2. IB PVC Single-Ply Membrane is to be attached according to IBRS specifications and details.

3. Membrane overlaps shall be shingled with the flow of water where possible.

B. IB Water Borne Adhesive

1. Once the substrate is prepared, roll the membrane out and position it as to be installed, and then carefully roll back the membrane half way. Apply adhesive as per step #2. Once the adhesive is applied, carefully roll the membrane back into its original position. Use a foam covered lawn roller to apply even pressure over the newly glued membrane areas. The remaining un-bonded half shall be folded back and the bonding procedure repeated.

2. Over the properly installed and prepared substrate surface, IB Water Borne Adhesive shall be applied using approved solvent resistant ¾" nap paint rollers. The adhesive shall be applied at a rate of approximately 150-200 sf per gallon to the substrate depending upon substrate and finish. See application rate charts in section 2.05. The adhesive shall be applied in a smooth, even coating with no holidays, globs, puddles, or similar irregularities. Only an area that can be covered completely before the adhesive dries shall be coated.

a. Drying time increases with cooler temperatures and high humidity conditions. The contractor shall check with an IBRS representative prior to roof operations on such days. (Do not apply if temperature

is below 40 °F)

b. The contractor shall count the amount of adhesive used per square, and the number of buckets of adhesive used per area per day to verify that he is conforming to the specified adhesive rate.

3. NO BONDING ADHESIVE SHALL BE APPLIED IN THE LAP AREAS.

C. Attachment Around Perimeter and Rooftop Penetrations

1. Around all perimeters, at the base of walls, drains, curbs, vent pipes, or any other roof penetrations. Fasteners shall be installed according to perimeter rate of attachment. Fasteners shall be installed according to IBRS instructions. Consult the Fully Adhered guide in the warranty section of the IBRS Division 7 Binder for specific fastening requirements. Fasteners shall clamp IB PVC Single-Ply Membrane tightly to the substrate.

2. IB PVC Single-Ply Membrane flashings shall extend 2" past the plate line and be hot-air welded to the IB PVC Single-Ply Membrane with AUTOMATIC 220 volt welding equipment, approved by IBRS.

D. Offset Perimeter Attachment (Peel Stop)

1. Install a Poly or Aluminum termination bar on all roof area that utilizes a drip edge type detail. The termination bar should be attached using approved fasteners to the structural decks. The termination bar should be laid out in a straight line no closer than 12" to the outside edge and no farther than 24". A 6" cover strip of IB flashing membrane shall be welded over the bar.

a. Structural Concrete 12" o.c.

b. Steel, Wood, Gypsum and Wood Fiber 6" o.c.

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3.10 Membrane Flashing

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the project manager and IBRS. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the new roofing due to incomplete flashings, the affected area shall be removed and replaced at the roofing contractor's expense.

A. Vertibond Contact Adhesive for Flashing

1. Over the properly installed and prepared substrate surface, Vertibond Adhesive shall be applied using approved solvent resistant paint rollers. The adhesive shall be applied to an approved substrate at a rate of

approximately 120 sf per gallon. The adhesive shall be applied in smooth, even coatings with no holidays, globs, puddles, or similar irregularities. Only an area that can be covered completely in the same day's operations shall be coated with adhesive. The surface with adhesive coating shall be allowed to dry completely prior to installing the membrane.
Notes:

a. Drying time increases with cooler temperatures and high humid conditions. The roofing contractor shall check with the IBRS technical representative prior to roof operations on such days.

b. The roofing contractor shall count the amount of adhesive used per square, and the number of buckets of adhesive used per area per day to verify that he is conforming to the specified adhesive rate.

2. When the surface is dry, the IB flashing membrane is cut to a workable length and the underside shall be coated evenly with Vertibond adhesive at a rate of 120 sf per gallon. NO BONDING ADHESIVE SHALL BE APPLIED IN LAP AREAS. While the adhesive is active (produces strings when touched with a dry finger), the coated membrane shall be rolled carefully onto the previously coated substrate to avoid wrinkles. Do not allow adhesive on the underside of the IB membrane to dry completely. The amount of membrane that can be coated with adhesive before applying to substrate will be determined by ambient temperature, humidity, and manpower. Adjacent sheets shall be overlapped a minimum of 4". IB flashings shall extend 5" onto the roofing membrane. The bonded sheet shall be pressed firmly into place with a hand roller.

3. No bonding adhesive shall be applied in lap areas that are to be welded to flashings or adjacent sheets. All sheets shall be applied in the same manner, lapping all sheets as required by welding techniques.

B. Mechanically attached for flashings.

1. Over a properly installed substrate surface. Apply IB PVC membrane flashing on the wall and fasten to the outside edge of the nailer. (For walls less than 18" high).

2. For walls taller than 18" fasten the membrane to the wall 12"o.c with fasteners and 2" plates. 6" up from the roof to wall transition and then every 18".

3. The next adjacent sheets should be overlapped 4" over the previous installed flashing and should extend 5" onto the deck membrane. Heat weld in place.

C. All flashings shall extend a minimum of 8" above roofing level unless previously accepted by the owner's representative and IBRS.

D. All interior and exterior corners and miters shall be cut and hot air welded into place.

E. All flashings shall be hot air welded at their joints and at their connections with the roof membrane.

F. IB flashings shall be terminated according to IBRS recommended details.

3.11 Hot-air welding of Seams & Overlaps

A. General

1. Adjacent sheets shall be welded in accordance with the manufacturer's written instructions. All side and end laps shall be hot-air welded.

2. Overlap is to be 5" when the plates are installed in the overlap.

3. Welding equipment shall be provided by or approved by IBRS.

4. All surfaces to be welded shall be clean according IBRS recommendations. No adhesive or other contaminants shall be present within the lap areas.

B. T-Seams

1. The point where two perpendicular lap seams intersect.

2. For 50 mil and 60 mil membrane T-Seams patches are not required, unless it has not been properly welded.

3. 80 mil membranes require the use of a 5" round reinforced membrane patch.

C. Hand Welding

1. IBRS requires automatic welders be used as much as possible. We encourage hand welding kept to detail work and smaller seams.

D. Machine Welding

1. IBRS automatic welding equipment will help to insure that proper field seams are made. When using this equipment, the manufacturer's instructions shall be followed and local codes for electric supply, grounding, and over current protection observed. The automatic welding machines require 218 to 230 volts at 20 amps. The use of a portable generator is recommended.

E. Quality Control of Welded Seams

1. The roofing contractor shall check all welded seams, after cooling, for continuity by use of the seam probe. The roofing contractor shall make a final probing of all welded seams and details at the conclusion of each day. When automatic welding equipment is first started or any time that the equipment is cooled and restarted a minimum of two seam test cuts is required. The test cut shall be approximately 2" wide, cross cutting the seam. These test cuts shall be dated, marked for location, and turned into the IBRS Technical Representative at the time of inspection.

3.12 Walkway Installation

A. General Criteria

1. Walkways shall be provided for regular maintenance of rooftop equipment and for roof areas subject to foot traffic.

B. Walk Tread Installation

1. Roofing membrane to receive Walk Tread shall be clean and dry.

2. Hot-air weld the perimeter of the Walk Tread to the IB PVC Single-Ply Membrane. Check all welds with a seam probe. Re-weld any inconsistencies.

C. Precast Concrete Paver Installation

1. Install concrete pavers over a protection layer such as separation sheet or a compatible pedestal.

3.13 Miscellaneous Metal Flashings

A. Metal, other than that supplied by IBRS, is not covered under the IBRS warranty.

B. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.

C. All fabrication practices and installation procedures shall conform to the applicable requirements of the following, unless otherwise specified and/or detailed:

1. Sheet Metal and Air Conditioning National Association Inc. (SMACNA – latest edition).

2. Factory Mutual Loss Prevention Data Sheet 1-49 (or latest edition).

3. National Roofing Contractors Association (NRCA – latest edition).

3.14 Temporary Cutoff

A. All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. When a break in the day's work occurs in the central area of a roof, a temporary water stop shall be constructed to provide a 100% watertight seal. When work on the new system is suspended, the stagger of the insulation joints shall be maintained by installing partial fillers. The new membrane shall be carried into the water stop. The water stop shall be sealed to the deck and/or substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of roof cement of 6" in width. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers, etc. shall be removed from the work area and disposed of off-site. None of these materials shall be used in the new work.

B. If inclement weather occurs while a temporary water stop is in place, the roofing contractor shall provide the necessary labor to monitor the situation and maintain a watertight condition.

C. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the roofing contractor's expense.

3.15 Completion

A. Prior to leaving the site, the owner/project manager and the roofing contractor shall review the work. All defects noted, non-compliances with the specifications, and the recommendations of IBRS shall be itemized in a punch list. The roofing contractor must immediately correct these items to meet the satisfaction of the owner/project manager and IBRS.

B. All warranties, as required in section 1.00 of this specification, shall be submitted to IBRS for approval. All materials purchased from IBRS shall be paid in full prior to the issuance of any warranty.

DISCLAIMER

IBRS has attempted to obtain information from the manufacturers of other products often used in conjunction with IBRS products with respect to the characteristics of such products, as well as their compatibility with those of IBRS. In as much as these other products, as supplied in the field, are subject to possible variation in their production, and in as much as their specifications and performance characteristics are subject to change without notification by the manufacturers, IBRS expressly excludes from its warranty any responsibility for the performance or quality of the products of others used in conjunction with IBRS products.