

SECTION 07 54 19
THERMOPLASTIC PVC MEMBRANE ROOFING
IB ROOF SYSTEMS STONE BALLASTED – LOOSE-LAID PVC SINGLE PLY MEMBRANES
or
IB ROOF SYSTEMS PAVER BALLASTED – FULLY ADHERED PVC SINGLE PLY MEMBRANES

Part 1 GENERAL

1.0 SECTION INCLUDES

- A. IB Roof Systems Ballasted, (Smooth or Fleece Backed) Polyester - Reinforced Thermoplastic PVC Roofing Membrane
- B. Cover Board
- C. Thermal Roof Insulation
- D. Flexible Membrane Flashings
- E. Metal Flashings
- F. IB Roof Systems Accessories

1.1 RELATED SECTIONS

- A. Section 03 30 00 Cast-In-Place Concrete
- B. Section 03 40 00 Precast Concrete
- C. Section 05 30 00 Metal Decking
- D. Section 06 10 00 Rough Carpentry
- E. Section 07 25 00 Weather Barriers
- F. Section 07 60 00 Flashing and Sheet Metal
- G. Section 07 70 00 Roof and Wall Specialties and Accessories
- H. Section 08 60 00 Roof Windows and Skylights
- I. Section 22 14 00 Facility Storm Drainage

1.2 REFERENCES

- A. American Society of Civil Engineers (ASCE):
 - 1. ASCE 7; Minimum Design Loads for Buildings and Other Structures. Revision as adopted by local code and Authority Having Jurisdiction.
- B. ASTM International (ASTM):
 - 1. ASTM C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
 - 2. ASTM C920: Standard Specification for Elastomeric Joint Sealants
 - 3. ASTM C1177: Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
 - 4. ASTM C1278: Standard Specification for Fiber-Reinforced Gypsum Panel
 - 5. ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
 - 6. ASTM C1325: Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units
 - 7. ASTM D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
 - 8. ASTM D4434: Standard Specification for Poly (Vinyl Chloride) Sheet Roofing
 - 9. ASTM D7655: Standard Classification for Size of Aggregate Used as Ballast for Membrane Roof Systems
 - 10. ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials
 - 11. ASTM E108: Standard Test Methods for Fire Tests of Roof Coverings
- C. Factory Mutual (FM Approvals / Roof Nav.):
 - 1. Factory Mutual Standard 4450: Approval Standard for Class 1 Insulated Steel Decks
 - 2. Factory Mutual Standard 4470: Approval Standard for Class 1 Roof Covers
 - 3. Factory Mutual Standard 4476: Approval Standard for Flexible Photovoltaic Modules
 - 4. Factory Mutual Standard 4481 - Approval Standard for Anchors for Roof Mounted Equipment

5. FM Global Property Loss Prevention Data Sheets 1-15, 1-28, 1-29, and 1-49
- D. Underwriters Laboratories (UL):
 1. UL 790: Standard Test Method for Fire Tests of Roof Coverings
- E. International Code Council (ICC)
 1. International Building Code (IBC)
 2. International Residential Code (IRC)
- F. CAN / CGSB 37.54-95
- G. Single Ply Roofing Institute (SPRI):
 1. ANSI / SPRI / ED-1: Design Standard for Edge Systems Used with Low Slope Roofing Systems, 2019 Edition.
 2. ANSI / SPRI / FM4435 / ES-1: Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems, Revision as adopted by local code and AHJ, 2017 Edition.
 3. ANSI / SPRI / GD-1: Structural Design Standard for Gutter Systems Used with Low-Slope Roofs, 2010 Edition.
 4. ANSI / SPRI / GT-1: Test Standard for External Gutter Systems, 2022 Edition.
 5. ANSI / SPRI / RP-4: Wind Design Standard for Ballasted Single-Ply Roofing Systems
- H. International Institute of Building Enclosure Consultants (IIBEC): Glossary of Roofing Terms.
- I. National Roofing Contractors Association (NRCA): Low Slope Roofing and Waterproofing Manual, 2019 Edition.
- J. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA): Architectural Sheet Metal Manual. 2012 Edition.

1.3 DESIGN CRITERIA

- A. Provide installed roofing system that remains watertight, resists specified uplift pressures and exposure to normal weathering conditions without failure. Roofing materials and accessories shall be tested and compatible for use within the assembly, installed in accordance with manufacturer requirements.
- B. Structural load limitation review of the roof deck and building structure is the responsibility of the building owner, design professional and their authorized representatives.
- C. Building Code Compliance: The roofing assembly shall comply with the requirements of the local building code and authorities for limitations on use of Ballasted Roof Systems within high-wind, hurricane-prone or urban areas.
- D. Fire Resistance Performance: Class _____ (A, B, C) external fire classification as tested in accordance with ASTM E108 or UL 790.
- E. Wind Uplift Performance: Roof system shall be designed and installed to withstand wind uplift pressures as calculated using ASCE 7, revision as adopted by the authorities having jurisdiction and conform to ANSI / SPRI RP-4 Wind Design Standard for Ballasted Single-Ply Roofing Systems.
 1. Roofing system shall be tested by a qualified testing agency to resist the following design pressures:
 - a. Zone 1'- Interior Field of Roof: _____ psf
 - b. Zone 1 - Exterior Field of Roof: _____ psf
 - c. Zone 2 - Perimeter Zone: _____ psf
 - d. Zone 3 - Corner Zone: _____ psf
 2. Field, Perimeter and Corner areas shall be fastened or secured in accordance with IB specifications and details, project design, and local code requirements. Perimeter and Corner Zones shall receive supplemental fastening or securement where required, to meet calculated pressures in these areas in accordance with IB requirements and the local authority having jurisdiction.
 3. Factory Mutual Approval (FM Projects Only): Roof system shall be installed in accordance with Class 1 or noncombustible construction in compliance with requirements of Factory Mutual Global FM 4450 and FM 4470.
 - a. Fire Hazard Classification: Class _____ (A, B or C)
 - b. Wind Uplift Classification: FM Class _____ or _____ psf MDP
 - c. Hail Resistance: _____ Severe Hail (SH) or Moderate Hail (MH)
- F. Roof System Reflectivity and Thermal Performance: Provide installed roofing system that complies with the following thermal performance and reflectivity requirements:
 1. Provide roof assembly to achieve a minimum total R-value of _____.
 2. Roof membrane shall be tested in accordance with ANSI / CRRC-1 Standard and comply with the following minimum reflectivity and emissivity requirements:
 - a. Minimum Initial Reflectance: _____

- b. Minimum 3-year Aged Reflectance: _____
- c. Initial SRI (Solar Reflectance Index): _____
- d. Energy Star: Initial solar reflectance of 0.65 with 3-year aged reflectance of .50 or greater.
- e. Roof system shall comply with the requirements of California Title 24.

1.4 ENVIRONMENTAL AND GREEN CONSTRUCTION DESIGN REQUIREMENTS

- A. Roof system shall comply with the following Environmental and Sustainable Design requirements:
 - 1. United States Green Building Council LEED Certification Program
 - a. Roof system shall be installed to achieve the following required LEED credits: _____
 - 2. Green Building Initiative Green Globes Certification
 - a. Roof system shall be installed to achieve the following Green Globes Rating System Certification points: _____
 - 3. Carbon Neutral Recovery Certification
 - a. Roof membrane shall be documented to achieve Carbon Neutrality within the specified warranty period after installation:
 - 1. 80-mil White: _____ years
 - 2. 60-mil White: _____ years
 - 3. 50-mil White: _____ years
 - b. Roof membrane shall be documented to avoid carbon emissions within the specified warranty period after installation for the specified period:
 - 1. 80-mil White: _____ years
 - 2. 60-mil White: _____ years
 - 3. 50-mil White: _____ years

1.5 SUBMITTALS

- A. Submit product data, samples, shop drawings and installer certification under provisions of Division 1 General Requirements Section 01 30 00.
- B. Product Data: Submit product data sheets indicating membrane materials, base flashing, insulation, separator/ thermal insulation, accessories and manufacturer's installation instructions and details including:
 - 1. Product Data Sheets
 - 2. Material Safety Data Sheets
 - 3. Roof assembly installation instructions and recommendations
 - 4. Required storage and handling recommendations
 - 5. Sample of Manufacturer's Warranty
 - 6. Manufacturer recommended Maintenance Program Data
 - 7. Submit certification from manufacturer of membrane roofing system certifying the installer is authorized by the manufacturer for installation of the specified roofing system and eligible to obtain the required Manufacturer's Warranty.
- C. Detail Drawings:
 - 1. Provide roof system elevation, section, plan, attachment, and construction detail drawings showing methods, components, flashing conditions and location of work on the project.
 - 2. Submit shop drawings of tapered insulation system for approval; show direction and amount of slope, cricket locations, lengths and details.
- D. Verification Samples: Submit a quantity of _____ samples for each product specified. Submit 4" x 6" (10.2 cm x 15.2 cm) PVC membrane samples in the specified color for approval.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 20 years documented experience.
- B. Installer Qualifications:
 - 1. Company specializing in the installation of thermoplastic roofing and all products included in this section with minimum five years documented experience.
 - 2. Installer must be authorized by the manufacturer and eligible to provide the required Manufacturer's Warranty.

3. Installer must provide an adequate number of experienced workers, trained in jobsite safety practices and skilled in the use of hot air welding equipment and the installation of materials and flashings used in the construction of the roofing assembly.
4. Installer shall always provide a project supervisor on the job while work is in progress.
- C. Application of Roofing: Work of this section shall conform to contract documents and manufacturer specifications. No deviations shall be made from this specification without the approval of the designer of record. Deviations from published manufacturer requirements require review and approval of the designer of record and written approval from the manufacturer on manufacturer's letterhead, signed by an authorized technical manager of the company. Where discrepancies exist, the Installer shall promptly notify the design professional, project engineer or owner for resolution prior to commencing work.
- D. Materials: Provide only top-quality materials of manufacturer complying with specification requirements. All materials shall be provided by the primary roofing system manufacturer or approved for use in conjunction with installation of the roofing assembly.
- E. Manufacturers Final Inspection: Manufacturer's technical representative shall conduct a final inspection upon completion of projects requiring a Manufacturer's Total System Warranty covering workmanship and material to determine if the assembly is in compliance with manufacturer requirements for issuance of the warranty. A punch list of defective work and conditions requiring repair shall be provided to the installer for correction.

1.7 PRECONSTRUCTION CONFERENCE

- A. Preconstruction Conference: A pre-roofing conference will be held in accordance with the contract documents at least one week prior to initiation of roofing work. Manufacturer representative, foreman for roofing contractor, estimator for roofing contractor, architect, owner representative, sheet metal contractor, general contractor and other required parties should be present to discuss the execution of the work.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact. Store products in weather-protected environment, clear of ground and moisture, secured against wind, moisture and damage. Prevent condensation beneath product packaging, coverings and temporary plastic shipping wrappers or shrouds by removing, opening and/or covering materials with breathable tarpaulins.
- B. Materials and equipment stored on the roof must be properly staged and supported to avoid damage and / or permanent deflection of deck. Spread loads of roofing materials on roof structures to avoid damage to existing structure. Use protective plywood as required. No material storage or construction traffic shall be allowed over new roofing unless properly protected to prevent damage and contamination on the finished roofing.
- C. Materials and equipment stored on the roof must be properly staged and supported to avoid damage and/or permanent deflection of deck. Spread loads of roofing materials on roof structures to avoid damage to existing structure. Use protective plywood as required. No material storage or construction traffic shall be allowed over new roofing unless properly protected to prevent damage and contamination on the finished roofing.
- D. Follow manufacturer's recommendations for environmental conditions and product storage. Bonding adhesives shall be stored at temperatures above 40°F (4.4°C). Materials shall be stored and maintained within manufacturer's published temperature ranges.
- E. Storage and disposal of hazardous materials shall comply with the requirements of local authorities having jurisdiction.

1.9 PROJECT CONDITIONS

- A. Precautions: Install roofing only when adequate application temperatures exist to maintain a satisfactory roofing system application. Apply no insulation or membrane adhesives to the substrate or roofing membranes when deck surface temperatures are less than the recommended application temperature range stated on the products labels, or printed literature. Install no roofing material when water in any form is present on roof deck or substrate surface, or when materials are damp or wet. Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.
- B. Temporary Roofing: Install watertight seals to protect work when adverse job conditions or weather conditions prevent permanent roofing and associated work from being installed in accordance with project requirements. Consult the designer of record and the primary roofing manufacturer regarding installation and removal of temporary roofing.

- C. Install new roofing to be complete and watertight by the close of each day's work.
- D. Avoid exposure of combustible materials to ignition source and follow all safety and handling cautions, warnings and recommendations for safe handling of materials. Material Safety Data Sheets shall be maintained at the jobsite, during transport and storage at all times.
- E. Moisture: Do not proceed with installation where potential exists for condensation or uncontrolled moisture migration into the roof system from construction-related moisture or installation over moisture bearing substrates or interiors without adequate ventilation and moisture control.
- F. All work shall be performed in accordance with applicable federal, state, and local requirements, codes, and safe work practices. Use of roof assembly adhesives, sealants, caulks, and related accessory materials shall conform to the requirements and VOC limits of the Authority Having Jurisdiction

1.10 WARRANTY

- A. Contractor Warranty: Contractor shall warrant roofing assembly components, accessories and associated work of this section against leaks or defective workmanship from date of substantial completion.
 - 1. Term of Warranty _____ years [two, five]
- B. Manufacturer's Limited Material Warranty: Submit executed copy of roofing manufacturer's (Commercial or Residential Limited Material, Warranty Plus Limited, Lifetime Residential Limited Material) warranty on materials from date of substantial completion.
 - 1. Term of Warranty _____ years [ten, fifteen, twenty, twenty-five]
- C. Manufacturer's Total System Warranty: Submit executed copy of roofing manufacturer's Total System Warranty against leaks due to defective materials or workmanship according to its standard published coverage, terms and conditions from date of substantial completion.
 - 1. Term of Warranty _____ years [ten, fifteen, twenty, twenty-five]

Part 2 PRODUCTS

2.0 MANUFACTURERS

- A. Acceptable Manufacturer: IB Roof Systems, 506 E. Dallas Road, Suite 300, Grapevine, Texas 75061
Toll-free: 800-426-1626
Fax: 541-610-1726
Email: technical@ibroof.com
Website: www.ibroof.com
- B. Substitutions: Not permitted.
- C. Substitution Requests: Submit in accordance with Section 01 60 00.

2.1 SCOPE / APPLICATION

- D. Roof System: Provide a IB PVC Single Ply waterproof roof system manufactured and supplied or approved by the primary roofing materials manufacturer as specified in this section.
 - 1. Stone Ballasted Loose-Laid Membrane: IB Roof Systems Specification _____ is the basis of design for the roofing assembly.
 - 2. Paver Ballasted Adhered Membrane: IB Roof Systems Specification _____ is the basis of design for the roofing assembly.
- E. Base Flashing: Provide waterproof base flashing assemblies and flashings at all penetrations, vertical walls, curbs, and terminations.
- F. Thermal Roof Insulation: Provide roof insulation components as specified herein, secured to the substrate in accordance with IB Specifications and the performance requirements of this section.

2.2 POLYVINYL CHLORIDE (PVC) MEMBRANE

- A. Roof Covering: Provide a PVC single ply roofing membrane constructed from a calendared film, non-extrusion lamination process with a non-wicking polyester scrim reinforcement and compounded PVC resin based with plasticizers, stabilizers, fillers, pigments with an acrylic finish conforming to ASTM D4434, Type III. Flashings and accessories shall be factory-manufactured or approved by IB Roof Systems coordinated with the specified membrane and finish color.
 - 1. IB PVC Single-Ply

- a. Smooth Back
2. IB PVC Single-Ply FB
 - a. Fleece Back (white only)
3. Color: _____
 - a. White
 - b. Bronze
 - c. Brown
 - d. Cool Sand
 - e. Cool Stone
 - f. Gray
 - g. Green
 - h. Red
 - i. Tan
 - j. Custom: _____
4. Membrane Thickness, overall (ASTM D751): 50-mil nominal
 - a. Thickness over scrim, (ASTM D751): 24 mils
 - b. Breaking strength (ASTM D751): 332 MD / 256 CD lbf
 - c. Tearing strength (ASTM D751): 54 MD / 68 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Field sheet width: 72 inches (1.83m)
 - f. Length: 90 feet (27.43m)
5. Membrane Thickness, overall (ASTM D751): 60-mil nominal
 - a. Thickness over scrim, (ASTM D751): 28 mils
 - b. Breaking strength (ASTM D751): 371 MD / 308 CD lbf
 - c. Tearing strength (ASTM D751): 58 MD / 72 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Field sheet width: 72 inches (1.83m)
 - f. Length: 90 feet (27.43m)
6. Membrane Thickness, overall (ASTM D751): 80-mil nominal
 - a. Thickness over scrim, (ASTM D751): 38 mils
 - b. Breaking strength (ASTM D751): 408 MD / 388 CD lbf
 - c. Tearing strength (ASTM D751): 62 MD / 78 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Field sheet width: 72 inches (1.83m)
 - f. Length: 60 feet (18.3m)
- B. Roof Covering: Provide IB PVC Single Ply ChemGuard® roofing membrane constructed from a calendared film, non-extrusion lamination process with a non-wicking polyester scrim reinforcement and compounded PVC resin based with Elvaloy®, stabilizers, fillers, pigments with an acrylic finish conforming to ASTM D4434, Type III. Flashings and accessories shall be factory-manufactured or approved by IB Roof Systems coordinated with the specified membrane and finish color.
 1. IB PVC Single-Ply ChemGuard®:
 - a. Smooth Back
 2. Color: _____
 - a. White
 3. Membrane Thickness, overall (ASTM D751): 50-mil nominal
 - a. Thickness over scrim, (ASTM D751): 24 mils
 - b. Breaking strength (ASTM D751): 332 MD / 256 CD lbf
 - c. Tearing strength (ASTM D751): 54 MD / 68 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Field sheet width: 72 inches (1.83m)
 - f. Length: 90 feet (27.43m)
 4. Membrane Thickness, overall (ASTM D751): 80-mil nominal
 - a. Thickness over scrim, (ASTM D751): 38 mils
 - b. Breaking strength (ASTM D751): 408 MD / 388 CD lbf
 - c. Tearing strength (ASTM D751): 62 MD / 78 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD

- e. Field sheet width: 72 inches (1.83m)
- f. Length: 60 feet (18.3m)
- C. PVC Flashing Membrane: Provide IB PVC Single Ply constructed from a calendared film, non-extrusion lamination process with a non-wicking polyester scrim reinforcement and compounded PVC resin based with plasticizers, stabilizers, fillers, pigments with an acrylic finish conforming to ASTM D4434, Type III. Flashings and accessories shall be factory-manufactured or approved by IB Roof Systems coordinated with the specified membrane and finish color.
 - 1. Membrane Type:
 - a. Smooth Back
 - 2. Color: _____
 - a. White
 - b. Bronze
 - c. Brown
 - d. Cool Sand
 - e. Cool Stone
 - f. Gray
 - g. Green
 - h. Red
 - i. Tan
 - j. Custom: _____
 - 3. Membrane Thickness, overall (ASTM D751): 50-mil nominal
 - a. Thickness over scrim, (ASTM D751): 24 mils
 - b. Breaking strength (ASTM D751): 332 MD / 256 CD lbf
 - c. Tearing strength (ASTM D751): 54 MD / 68 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Width: 72 inches (1.83m)
 - f. Length: 90 feet (27.43m)
 - 4. Membrane Thickness, overall (ASTM D751): 60-mil nominal
 - a. Thickness over scrim, (ASTM D751): 28 mils
 - b. Breaking strength (ASTM D751): 371 MD / 308 CD lbf
 - c. Tearing strength (ASTM D751): 58 MD / 72 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Width: 72 inches (1.83m)
 - f. Length: 90 feet (27.43m)
 - 5. Membrane Thickness, overall (ASTM D751): 80-mil nominal
 - a. Thickness over scrim, (ASTM D751): 38 mils
 - b. Breaking strength (ASTM D751): 408 MD / 388 CD lbf
 - c. Tearing strength (ASTM D751): 62 MD / 78 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Field sheet width: 72 inches (1.83m)
 - f. Length: 60 feet (18.3m)
- D. PVC Flashing Membrane: Provide IB PVC Single Ply ChemGuard® constructed from a calendared film, non-extrusion lamination process with a non-wicking polyester scrim reinforcement and compounded PVC resin based with Elvaloy®, stabilizers, fillers, pigments with an acrylic finish conforming to ASTM D4434, Type III. Flashings and accessories shall be factory manufactured or approved by IB Roof Systems, coordinated with the specified membrane and finish color.
 - 1. 1. Membrane Type:
 - a. Smooth Back
 - 2. 2. Color: _____
 - a. White
 - 3. 3. Membrane Thickness, overall (ASTM D751): 50-mil nominal
 - a. Thickness over scrim, (ASTM D751): 24 mils
 - b. Breaking strength (ASTM D751): 332 MD / 256 CD lbf
 - c. Tearing strength (ASTM D751): 54 MD / 68 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Width: 72 inches (1.83m)

- f. Length: 90 feet (27.43m)
- 4. 4. Membrane Thickness, overall (ASTM D751): 80-mil nominal
 - a. Thickness over scrim, (ASTM D751): 38 mils
 - b. Breaking strength (ASTM D751): 408 MD / 388 CD lbf
 - c. Tearing strength (ASTM D751): 62 MD / 78 CD lbf
 - d. Elongation at break (ASTM D751): 34% MD / 29% CD
 - e. Width: 72 inches (1.83m)
 - f. Length: 60 feet (18.3m)

2.3 INSULATION

- A. Polyisocyanurate: Rigid thermal roof insulation board with fiber reinforced facers on both sides meeting or exceeding the requirements of ASTM C1289.
 - 1. IB Energy Board II supplied by IB Roof Systems
 - a. Board Size: _____
 - I. 4' x 4' (1.22m x 1.22m)
 - II. 4' x 8' (1.22m x 2.44m)
 - b. Minimum Thickness: _____
 - c. Minimum R-Value: _____
 - d. Compressive Strength: 20 psi (1.4 kg/cm)
 - e. Compressive Strength: 25 psi (1.8 kg/cm)
- B. Polyisocyanurate: Rigid thermal, tapered roof insulation board with fiber reinforced facers on both sides meeting or exceeding the requirements of ASTM C1289.
 - 1. Tapered IB Energy Board II supplied by IB Roof Systems
 - a. Board Size: _____
 - I. 4' x 4' (1.22m x 1.22m)
 - b. Minimum Slope per Foot: _____
 - I. 1/8"
 - II. 1/4"
 - III. 1/2"
 - c. Minimum Starting Thickness: _____
 - d. Minimum Average R-Value: _____
 - e. Compressive Strength: 20 psi (1.4 kg/cm)
 - f. Compressive Strength: 25 psi (1.8 kg/cm)
- C. Polyisocyanurate: Rigid thermal roof insulation board with fiberglass facers on both sides meeting or exceeding the requirements of ASTM C1289.
 - 1. IB Energy Board III supplied by IB Roof Systems
 - a. Board Size: _____
 - I. 4' x 4' (1.22m x 1.22m)
 - II. 4' x 8' (1.22m x 2.44m)
 - b. Minimum Thickness: _____
 - c. Minimum R-Value: _____
 - d. Compressive Strength: 20 psi (1.4 kg/cm)
 - e. Compressive Strength: 25 psi (1.8 kg/cm)
- D. Polyisocyanurate: Rigid thermal, tapered roof insulation board with fiberglass facers on both sides meeting or exceeding the requirements of ASTM C 1289.
 - 1. Tapered IB Energy Board III supplied by IB Roof Systems
 - a. Board Size: _____
 - I. 4' x 4' (1.22m x 1.22m)
 - b. Minimum Slope per Foot: _____
 - I. 1/8"
 - II. 1/4"
 - III. 1/2"
 - c. Minimum Starting Thickness: _____
 - d. Minimum Average R-Value: _____
 - e. Compressive Strength: 20 psi (1.4 kg/cm)
 - f. Compressive Strength: 25 psi (1.8 kg/cm)

- E. High Density Polyisocyanurate Cover Board: Rigid thermal, high density roof insulation board with coated fiberglass facers on both sides meeting or exceeding requirements of ASTM C1289, Type II, Class 4, Grade 1.
1. Coverboard: _____
 - a. Hunter Panels H-Shield HD supplied by IB Roof Systems
 2. Board Size: _____
 - I. 4' x 4' (1.22m x 1.22m)
 - II. 4' x 8' (1.22m x 2.44m)
 3. Minimum Thickness: 1/2" (13 mm)
 4. Minimum Average R-Value: 2.5
 - a. Compressive Strength: 80 – 109 psi (5.6 – 7.7 kg/cm)
- F. Gypsum Fiber Roof Board: Moisture resistant, fiber reinforced gypsum roof board with integral water resistant core conforming to the requirements of ASTM C1177 or ASTM C1278.
1. Securock® Gypsum-Fiber Roof Board supplied by IB Roof Systems
 2. Board Size: _____
 - a. 4' x 4' (1.22m x 1.22m)
 - b. 4' x 8' (1.22m x 2.44m)
 3. Board Thickness: _____
 - a. 1/4" (6.3 mm)
 - b. 3/8" (9.5 mm)
 - c. 1/2" (13 mm)
 - d. 5/8" (16 mm)
 4. Minimum R-Value: _____
- G. Gypsum Roof Board with Glass Mat Facer: Standard, pre-primed or coated, moisture-resistant gypsum board with silicone treated core and embedded fiberglass facer on both sides conforming to the requirements of ASTM C1177.
1. Glass Mat Gypsum Roof Board:
 - a. DensDeck® Roof Board supplied by IB Roof Systems
 - b. DensDeck® Prime Roof Board supplied by IB Roof Systems
 - c. DensDeck® StormX™ Prime® Roof Board supplied by IB Roof Systems
 - d. Securock® Ultralight Glass-Mat Roof Board supplied by IB Roof Systems
 - e. Securock® Ultralight Coated Glass-Mat Roof Board supplied by IB Roof Systems
 - f. DEXCell® Glass Mat Roof Board supplied by IB Roof Systems
 - g. DEXCell® FA Glass Mat Roof Board supplied by IB Roof Systems
 2. Board Size: _____
 - a. 4' x 4' (1.22m x 1.22m)
 - b. 4' x 8' (1.22m x 2.44m)
 3. Board Thickness: _____
 - a. 1/4" (6.3 mm)
 - b. 1/2" (13 mm)
 - c. 5/8" (16 mm)
 4. Minimum R-Value: _____
- H. Cement Board: Moisture-resistant, cement roof boards in various thicknesses with integral water-resistant cores available in un-faced, fiberglass faced or primed fiberglass facer formats conforming to the requirements of ASTM C1325.
1. Cement Board
 - a. DEXCell® Cement Roof Board supplied by IB Roof Systems
 - b. USG Securock® Brand Cement Roof Board supplied by IB Roof Systems
 2. Board Size: _____
 - a. 4' x 4' (1.22m x 1.22m)
 - b. 4' x 8' (1.22m x 2.44m)
 3. Board Thickness: _____
 - a. 1/2" (13 mm)
 - b. 5/8" (16 mm)
 4. Minimum R-Value: _____
- I. Expanded Polystyrene (EPS): Rigid, closed cell foam insulation conforming to the requirements of ASTM C578. Requires IB approved gypsum or high-density Isocyanurate coverboard, high density fiberboard, or additional

top layer of polyisocyanurate or other approved non-EPS or XPS insulation.

1. EPS Roof Board:
 - a. Cellofoam EPS insulation supplied by IB Roof Systems
 - b. Insulfoam EPS insulation supplied by IB Roof Systems
 - c. Thermafoam EPS insulation supplied by IB Roof Systems
 - d. ThermalStar EPS insulation supplied by IB Roof Systems
2. Board Size: _____
 - a. 4' x 8' (1.22m x 2.44m)
3. Board Thickness: _____
4. Minimum R-Value: _____
5. Board Type: _____
 - a. Type II, nominal density of 1.5 pcf; Compressive Strength: 15 psi (1.0 kg/cm)
 - b. Type IX, nominal density of 2.0 pcf; Compressive Strength: 25 psi (1.8 kg/cm)
- J. Extruded Polystyrene (XPS) roof insulation; Rigid, closed cell, flat, or tapered extruded polystyrene foam insulation with integral formed skin or planed exterior faces, conforming to the requirements of ASTM C578, Type IV; nominal minimum compressive strength of 25 psi (1.8 kg/cm).
 1. XPS Roof Board:
 - a. DuPont™ Styrofoam™ Brand DECKMATE™ Plus FA supplied by IB Roof Systems
 - b. DuPont™ Styrofoam™ Brand DECKMATE™ Plus supplied by IB Roof Systems
 - c. DuPont™ Styrofoam™ Brand DECKMATE™ supplied by IB Roof Systems
 2. Board Size: _____
 - a. 4' x 8' (1.22m x 2.44m)
 3. Board Thickness: _____
 4. Minimum R-Value: _____
 5. Board Type: _____
 - a. Type IV, nominal density of 1.55 pcf; Compressive Strength: 25 psi (1.8 kg/cm)
 - b. Note: Requires IB approved gypsum or high-density polyisocyanurate coverboard, high density fiberboard, or additional top layer of polyisocyanurate or other approved non-EPS or XPS insulation.

2.4 MEMBRANE FLASHINGS AND ACCESSORIES

- A. Cover Strip: Reinforced 60-mil thermoplastic PVC flashing and stripping membrane made from the same material as IB PVC Single Ply Roofing Membrane with non-wicking polyester fiber reinforcement conforming to ASTM D4434, Type III.
- B. ChemGuard® Cover Strip: Reinforced 50-mil thermoplastic PVC flashing and stripping membrane made from the same material as IB PVC Single Ply ChemGuard® Roofing Membrane with non-wicking polyester fiber reinforcement conforming to ASTM D4434, Type III.
- C. Flashing Detail Membrane: Non-reinforced 60-mil thermoplastic PVC flashing and detailing membrane.
 1. IB NR Detail Flashing Membrane
- D. T-Joint Patches: Reinforced PVC T-Joint flashing cut into 5" (12.7 cm) diameter circular targets for reinforcing lap intersections in membrane and flashings.
 1. IB Round T-Joint Patch
 2. IB Round T-Joint Patch ChemGuard®
- E. Inside Corners: Factory-manufactured 60-mil non-reinforced inside corner for non-canted 90° flashings.
 1. IB Inside Corner
- F. Outside Corners: Factory-manufactured 60-mil non-reinforced outside corner for non-canted 90° flashings.
 1. IB Outside Corner
- G. Universal Outside Corners: Factory-manufactured, 60-mil fluted non-reinforced outside corner for canted and non-canted 90° flashings.
 1. IB Universal Outside Corner
- H. Pipe Flashings: Dielectrically welded, factory manufactured PVC flashing with reinforced membrane base and 60-mil PVC upper flashing used for pipe penetrations.
 1. IB PVC Pipe Flashing
 2. IB PVC ChemGuard® Pipe Flashing
 - a. Size: _____
 3. IB PVC No-Cone Pipe Flashing
 4. IB PVC ChemGuard® No-Cone Pipe Flashing

- a. Size: _____
- 5. IB PVC Steep Slope Flashing
- 6. IB PVC ChemGuard® Steep Slope Flashing
 - a. Oval
 - I. Size: _____
 - b. Round
 - I. Size: _____
- I. Vent Flashings: One and two-way PVC molded roof vents manufactured from heavy duty, UV-stabilized PVC with factory welded reinforced membrane target patch bases.
 - 1. 5" (12.7 cm) Two Way Recover Vent
 - a. IB PVC Single Ply Recover Membrane Vent
 - b. IB PVC Single Ply ChemGuard® Recover Membrane Vent
 - 2. 10" (25.4 cm) Roof Vent
 - a. IB PVC Single Ply 10" (25.4 cm) Roof Vent
 - b. IB PVC Single Ply ChemGuard® 10" (25.4 cm) Roof Vent
- J. Rooftop Dryer / Exhaust Vent Flashing: Two-piece, G90 galvanized metal exhaust vent with flanged base, Kynar 500® finished cap and internal backdraft dampers designed for use with IB No-Cone Pipe Flashing.
 - 1. IB Dryer Vent / Exhaust Vent
 - a. Size: _____
 - I. 4" (10.2 cm)
 - II. 6" (15.2 cm)
 - III. 8" (20.3 cm)
- K. Penetration Pocket Flashings: Factory-manufactured split PVC clad metal flashing with reinforced membrane base used for pitch pan penetrations.
 - 1. IB PVC Split Pitch Pan Flashing
 - 2. IB PVC ChemGuard® Split Pitch Pan Flashing
 - a. Size: _____
- L. PVC Clad Metal Scuppers: Factory-fabricated, custom sized through wall scupper manufactured from 24-gauge G90 galvanized, PVC clad metal with IB 0.060 non-reinforced membrane flashing.
 - 1. IB Custom Clad Metal Through-Wall Scupper
 - 2. IB Custom Clad Metal Through-Wall Overflow Scupper
- M. Retrofit Drains: Factory-fabricated, clamping ring style roof drain made of spun-bonded aluminum with IB 60-mil reinforced membrane flashing.
 - 1. IB Retrofit Drain
 - 2. IB Retrofit Overflow Drain
 - a. Size: _____
- N. Walkway Pad: Calendared and embossed 80-mil slip resistant, heat weldable PVC walk tread for use with IB Roof Systems in 3' x 60' (0.91m x 18.3m) rolls.
 - 1. IB WalkTread™
 - a. Color: _____
 - I. Gray
 - II. Safety Yellow
- O. GrossGrip: Slip resistant walkway system for roof and worker protection in high maintenance rooftop areas, where access for installation and maintenance of solar power systems, HVAC, telecommunications, and auxiliary equipment is necessary. Open grid "duckboard" design with cross directional top ribs in 3' x 33' (0.91m x 10.1m) rolls.
 - 1. IB CrossGrip™
 - a. Color: _____
 - I. Gray
 - II. Black
 - III. White
 - IV. Yellow

2.5 CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

- A. Water-Based PVC Bonding Adhesive: Water-based membrane adhesive designed for one-sided, fully adhered application of IB Roof Systems Single Ply membranes to approved horizontal substrates.

1. IB Water Borne Adhesive
2. IB Water Borne 636 Adhesive
- B. Solvent-Based PVC Bonding Adhesive: Solvent-based membrane adhesive designed for two-sided, fully adhered contact adhesion of IB Roof Systems Single Ply membranes to approved vertical and horizontal substrates.
 1. IB Vertibond Adhesive
 2. IB Vertibond 432 Bonding Adhesive
 3. ICP Polyset PVC Spray Contact Adhesive supplied by IB Roof Systems
- C. Two Component Membrane Adhesive: Two-component, low-rising expanding polyurethane adhesive designed to adhere IB PVC Fleece Back membranes to various approved horizontal substrates using a compatible factory supplied, delivery applicator.
 1. IB Rapid Set Insulation Adhesive by IB Roof Systems.
 2. ICP Polyset® CR-20 HFO Adhesive supplied by IB Roof Systems
 3. OMG OlyBond500® Cannisters Adhesive supplied by IB Roof Systems
- D. Night Sealant: two-component spray polyurethane foam (SPF) is specifically designed to provide a temporary seal of the new roofing membrane to the existing roof system using a compatible factory supplied, delivery applicator.
 1. ICP Polyset® Roof Seal supplied by IB Roof Systems
- E. Water Cut-Off Mastic: Butyl-based one-component mastic used as a compression sealant between IB membrane and flashings to applicable substrates.
 1. IB Water Stop
- F. Polyurethane Caulk Sealant: One part polyurethane sealant suitable for sealing upper lip of exposed termination bars and around upper edge of penetration clamping rings, meets or exceeds ASTM C920.
 1. Solar Seal #900 Terpolymer Rubber Adhesive / Sealant by NPC supplied by IB Roof Systems.
- G. High Performance Sealant: High performance, plasticizer free, single component, 100% solids, moisture-curing sealant for sealing terminations, metal flashings and filling pitch pans.
 1. IB Sealer by IB Roof Systems
- H. One Part Pourable Penetration Sealant: One-part pourable sealant suitable for filling pitch pans at irregularly shaped penetrations.
 1. Chemlink 1-Part Pourable Sealer supplied by IB Roof Systems
 2. IB Sealer by IB Roof Systems
- I. Self-Adhered Vapor Retarder Primer: Solvent-based primer with enhanced resins and polymers for use over prepared substrates to improve self-adhered membrane adhesion to a variety of substrates.
 1. IBarrier Primer by IB Roof Systems
 2. IBarrier Primer LV by IB Roof Systems

2.6 SEPARATION SHEETS, FIRE SHEETS AND VAPOR RETARDERS

- A. Polyester Separation / Protection Sheet: Non-woven polyester UV-stabilized mat, used as a separation sheet beneath membranes, or as a protection layer over membranes in ballast-applied and overburden assemblies.
 1. IB Poly Separator Sheet (7' 6" x 360'); (2.3m x 109.7m)
 2. IB HD Poly Separator Sheet (7' 6" x 150'); (2.3m x 45.7m)
- B. Separation Sheet: High-strength, polypropylene scrim reinforced fabric with polypropylene coating both sides used as separation sheet beneath membranes to resist contaminant, residue transfer and moisture from existing substrates.
 1. IB Separator Sheet (5.83' x 515'); (1.8m x 156.9m)
- C. Fire Sheet: Fire resistant glass fiber mat used as a separation sheet over polystyrene foam insulation or beneath insulation over wood substrates.
 1. IB Fire Sheet 10 (4' x 250'); (1.2m x 76.2m)
- D. Vapor Retarder: Self-adhered SBS-modified bitumen vapor retarder for steel, concrete, plywood and approved insulated substrates with tri-laminated woven polyethylene top surface and integral release film on bottom.
 1. IBarrier SA Membrane (3' 7" x 133'); (1.09m x 40.5m)

2.7 FASTENERS

- A. Standard Fasteners: Standard gauge alloy steel fastener with corrosion resistant e-coating and .228-inch diameter thread: Factory Mutual Standard 4470 approved #3 Phillips truss head for use on approved decks.

1. IB SD #12 Insulation Fastener
- B. HD Fasteners: Heavy duty gauge alloy steel fastener with corrosion resistant e-coating and .242-inch diameter thread: Factory Mutual Standard 4470 approved #3 Phillips truss head for use on approved decks.
 1. IB HD #14 Roofing Fastener
- C. XHD Fasteners: Heavy duty gauge alloy steel fastener with corrosion resistant e-coating and .260-inch diameter thread: Factory Mutual Standard 4470 approved #3 Phillips truss head for use on approved decks.
 1. IB XHD #15 Roofing Fastener
- D. Purlin Fasteners: Standard gauge alloy steel fastener with corrosion resistant e-coating and .209-inch diameter thread: Factory Mutual Standard 4470 approved #3 square drive head for drilling through steel purlin thicknesses of 18 ga (.045" nominal) through 1/4" (.250").
 1. IB #12 Purlin Fastener
- E. Stainless Fasteners: 410 stainless steel fastener with corrosion resistant e-coating and .235-inch diameter thread: Factory Mutual Standard 4470 approved #3 Phillips truss head for use on approved decks.
 1. IB #14 Stainless Roofing Fastener
- F. Concrete Anchor: Hammer-in, non-threaded fastener designed to secure insulation and membrane to structural concrete. Alloy steel fastener with a corrosion resistant e-coating and .239-inch shank diameter: Factory Mutual Standard 4470 approved 1/2" mushroom drive head.
 1. Dekspike Concrete Anchor supplied by IB Roof Systems
- G. Concrete Fastener: Hammer-in, non-threaded fastener designed to secure insulation and membrane to structural concrete. Alloy steel fastener with a corrosion resistant e-coating and split bulb shank of .270 - .277-inch diameter: Factory Mutual Standard 4470 approved flat top pan head.
 1. CD-10 Concrete Fastener supplied by IB Roof Systems
- H. Barbed Seam Plate: Galvalume, barbed fastening plate used with IB HD #14 Roofing Fastener, IB XHD #15 Roofing Fastener, IB #12 Purlin Fastener, CD-10 Concrete Anchor, and DekSpike Roofing Fasteners for securement and termination of IB membranes at penetrations and perimeter walls or edges.
 1. IB 2" (5.1 cm) Barbed Seam Plate
 2. IB 2-3/8" (6 cm) Barbed Seam Plate
- I. Insulation Plate: Galvalume-coated steel insulation plates used with IB SD #12 Insulation Fastener, HD #14 Roofing Fastener, XHD #15 Roofing Fastener, CD-10 Concrete Anchor, and DekSpike Roofing Fasteners to attach approved separator sheets, rigid insulation, and cover boards to approved substrates below IB membranes.
 1. IB 3" (7.6 cm) Galvalume Insulation Plate
- J. Multi-Purpose Termination Fastener: EPDM grommated anchor designed to secure termination bar, counter flashing, and various metal flashings to wood, concrete, masonry, and steel. Zinc aluminum composition with corrosion resistant e-coating on thread meets FM Approval Standard 4470.
 1. ZAC Anchors supplied by IB Roof Systems
- K. Zinc Term Bar Anchors: Mushroom head, expanding zinc plated steel nailin anchor designed to secure termination bar, counter flashing, and various metal flashings to concrete, brick, and filled masonry walls. Zamac alloy composition with corrosion resistant e-coating on thread meets FM Approval Standard 4470.
 1. Zinc Nailin Anchor supplied by IB Roof Systems
- L. Batten Bar: 1" (25 mm) Galvalume Steel or Polymer Batten Bar with pre-punched holes used in seam or through membrane with cover strip on IB membranes.
 1. IB Heavy Duty Steel Batten Bar
 2. IB Polymer Batten Bar

2.8 EDGINGS AND TERMINATIONS

- A. Anchor Tite Drip Edge: Two-part edge metal assembly with a rigid extruded aluminum anchor bar with pre-punched holes, 12" (30.5 cm) o.c. and decorative 24 ga. steel or .040 aluminum snap on fascia cover in 12' (3.66m) lengths. A wide range of standard colors and finishes are available. ES-1 tested and approved. FM Approved. Miami-Dade Approved (No. 18-0424.06 12/11/23) for use in the High Velocity Hurricane Zone. Available Lifetime, 215 mph wind warranty.
 1. Anchor Tite Drip Edge (12' lengths); (3.66m)
 - a. Cover Type: _____
 - I. 24-gauge Steel
 - II. .040 Aluminum
 - b. Face Size: _____

- I. 3" (7.6 cm)
 - II. 4-1/2" (11.4 cm)
 - III. 6" (15.2 cm)
 - IV. 7-1/2" (19 cm)
 - V. Custom: _____"
 - c. Color: _____
- B. PVC Clad Drip Edge: 24-gauge G90 corrosion resistant galvanized steel laminated to 0.045 PVC non-reinforced cladding, formed into a standard metal drip edge profile with an open-hem kick-out at the bottom to provide a corrosion resistant, heat weld-able perimeter roof edge termination supplied by IB Roof Systems. ES-1 tested and approved with use of CS Steel G90 22-gauge cleat on standard sizes.
1. IB PVC Clad Drip Edge (3" deck flange, 10' lengths); (7.6 cm x 3.05m)
 - a. Face Size: _____
 - I. 2.5" (6.3 cm)
 - II. 4" (10.2 cm)
 - III. Custom: _____"
 - b. Color: _____
 - I. White
 - II. Bronze
 - III. Gray
 - IV. Tan
- C. PVC Clad Gravel Stop Metal Edge: 24-gauge G90 corrosion resistant galvanized steel laminated to 0.045 PVC non-reinforced cladding, formed into a gravel stop edge profile with a 3/4" (18 mm) rise and with an open-hem kick-out at the bottom to provide a corrosion resistant, heat weld-able perimeter roof edge termination supplied by IB Roof Systems. ES-1 tested and approved with use of CS Steel G90 22-gauge cleat on standard sizes.
1. IB PVC Clad Gravel Stop Metal Edge (3" deck flange, 10' lengths); (7.6 cm x 3.05m)
 - a. Face Size: _____
 - I. 2.5" (6.3 cm)
 - II. 4" (10.2 cm)
 - III. Custom: _____"
 - b. Color: _____
 - I. White
 - II. Bronze
 - III. Gray
 - IV. Tan
- D. PVC Clad Drip Edge Stainless Steel Metal: 24-gauge SAE 304 stainless steel laminated to 0.045 PVC non-reinforced cladding, formed into a standard metal drip edge profile with an open-hem kick-out at the bottom to provide a corrosion resistant, heat weld-able perimeter roof edge termination supplied by IB Roof Systems. ES-1 tested and approved with use of 22-gauge stainless steel cleat on standard sizes.
1. IB PVC Clad Drip Edge Stainless Steel (3" deck flange, 10' lengths); (7.6 cm x 3.05m)
 - a. Face Size: _____
 - I. 2.5" (6.3 cm)
 - II. 4" (10.2 cm)
 - III. Custom: _____"
 - b. Color: _____
 - I. White
- E. PVC Clad Gravel Stop Stainless Steel Metal Edge: 24-gauge SAE 304 stainless steel laminated to 0.045 PVC non-reinforced cladding, formed into a gravel stop edge profile with a 3/4" (18 mm) rise and with an open-hem kick-out at the bottom to provide a corrosion resistant, heat weld-able perimeter roof edge termination supplied by IB Roof Systems. ES-1 tested and approved with use of 22-gauge stainless steel cleat on standard sizes.
1. IB PVC Clad Gravel Stop Stainless Steel Metal Edge (3" deck flange, 10' lengths); (7.6 cm x 3.05m)
 - a. Face Size: _____
 - I. 2.5" (6.3 cm)
 - II. 4" (10.2 cm)
 - III. Custom: _____"
 - b. Color: _____
 - I. White

- F. PVC Coated Metal: 24-gauge G90 corrosion resistant galvanized steel sheets laminated to 0.045 PVC non-reinforced cladding used in the fabrication of PVC flashings.
1. IB PVC Clad Metal (4' x 10' sheets); (1.22m x 3.05m).
 - a. Color: _____
 - I. White
 - II. Bronze
 - III. Gray
 - IV. Tan
- G. PVC Coated Stainless Steel Metal: 24-gauge SAE 304 stainless steel sheets laminated to 0.045 PVC non-reinforced cladding used in the fabrication of PVC flashings.
1. IB PVC Clad Metal (4' x 10' sheets); (1.22m x 3.05m).
 - a. Color: _____
 - I. White
- H. Aluminum Termination Bar: Extruded aluminum bar with angled lip caulk receiver and lower leg bulb stiffener. Pre-punched holes at 6" (15.2 cm) o.c.
1. IB Aluminum Termination Bar (1" x 10' lengths); (25 mm x 3.05m)
- I. PVC Termination Bar: 24-gauge G90 corrosion resistant galvanized steel laminated to 0.045 PVC non-reinforced cladding formed into termination bar with angled lip caulk receiver and lower him stiffener.
1. IB PVC Clad Termination Bar (2" x 10' lengths); (5.1 cm x 3.05m)
 - a. Color: _____
 - I. White
 - II. Bronze
 - III. Gray
 - IV. Tan
- J. IB Snap Fascia: Two-piece assembly with a raised rigid .063 aluminum retainer/clip base plate and a raised decorative coated galvanized steel or aluminum, snap on face cover designed for terminating IB PVC membrane systems at the perimeter edges, or for vertically terminating IB PVC base flashing. Cover is 10' (3.05m) lengths with pre-punched holes for fastening 12" (30.5 cm) on center.
1. IB Snap Fascia (10' lengths); (3.05m)
 - a. Cover Type: _____
 - I. 24-gauge Steel
 - II. 22-gauge Steel
 - III. 1.032 Aluminum
 - IV. .040 Aluminum
 - V. .050 Aluminum
 - b. Face Size: _____"
 - I. 2-1/4" (standard); (5.7 cm)
 - II. Custom: _____"
 - c. Color: _____
 - I. White
 - II. Bronze
 - III. Tan
 - IV. Gray
 - V. Custom: _____
- K. Metal-Era One Coping: Two-piece metal coping assembly, in a flat or tapered design, with a 22-gauge galvanized steel cleat, and a decorative steel or aluminum coping cover in 12' (3.66m) lengths with pre-punched holes. A wide range of standard colors and finishes are available. ES-1 tested and approved. Available with 10-year, 90 mph wind warranty.
1. One Coping (12' lengths); (3.66m)
 - a. Cover Type: _____
 - I. 24-gauge Steel
 - II. 22-gauge Steel
 - III. .040 Aluminum
 - IV. .050 Aluminum
 - V. .063 Aluminum
 - b. Slope Style: _____

- I. Flat
 - II. Tapered (Raised Cleat)
- c. Coping Width: _____
- d. Inside Face Size: _____
- e. Outside Face Size: _____
- f. Color: _____
- L. Perma-Tite Coping: Full Snap-On metal coping, in a flat or tapered design, with 20-gauge, galvanized steel anchor clips and factory-applied stainless-steel springs, and a decorative steel or aluminum coping cover in 12' (3.66m) lengths. A wide range of standard colors and finishes are available. ES-1 tested and approved. FM Approved. Miami-Dade Approved (No. 18-0424.06 12/11/23) for use in the High Velocity Hurricane Zone. Available with 20-year, 120 mph Perma-Tite wind warranty.
 - 1. Perma-Tite Coping (12' lengths); (3.66m)
 - a. Cover Type: _____
 - I. 24-gauge Steel
 - II. 22-gauge Steel
 - III. .040 Aluminum
 - IV. .050 Aluminum
 - V. .063 Aluminum
 - b. Slope Style: _____
 - I. Flat
 - II. Tapered (Raised Cleat)
 - c. Coping Width: _____
 - d. Inside Face Size: _____
 - e. Outside Face Size: _____
 - f. Color: _____
- M. Perma-Tite Gold Coping: Full Snap-On metal coping, in a tapered design, with 16-gauge, galvanized steel anchor clips and factory-applied stainless-steel springs, and a decorative steel or aluminum coping cover in 12' (3.66m) lengths. A wide range of standard colors and finishes are available. ES-1 tested and approved. FM Approved. Miami-Dade Approved (No. 18-0424.06 12/11/23) for use in the High Velocity Hurricane Zone. Available with Lifetime, 215 mph Perma-Tite wind warranty.
 - 1. Perma-Tite Coping (12' lengths); (3.66m)
 - a. Cover Type: _____
 - I. 24-gauge Steel
 - II. 22-gauge Steel
 - III. .040 Aluminum
 - IV. .050 Aluminum
 - V. .063 Aluminum
 - b. Slope Style: _____
 - I. Tapered Version only
 - c. Coping Width: _____
 - d. Inside Face Size: _____
 - e. Outside Face Size: _____
 - 2. Color: _____

2.9 SURFACING

- A. Ballast: Smooth, river bottom stone conforming with grade requirements of ASTM D7655 / D7655M.
 - a. Field Zones: #4 Ballast: Nominal 1-1/2" (3.8 cm)
 - b. Perimeter & Corner Zones: #2 Ballast: Nominal 2-1/2" (6.3 cm)
- B. Concrete Pavers: Interlocking or Pedestal type meeting the following requirements:
 - 1. Thickness: 1-1/2" nominal (3.8 cm)
 - 2. Weight: 10 lbs. / sq. ft. (49 kg/sq. m.) [field zones]; 22 lbs. sq. ft. 108 kg/sq. m.) [perimeter/corner zones]
 - 3. Compressive Strength: 5,000 psi (196,132 kg f/cm)
 - 4. Density: 125 pcf
- C. Solar: PV solar array must be designed and installed by a licensed and authorized integrator. Solar arrays may be ballast style, non-penetrating racking system type, or a penetrating type secured to a U-Anchor supplied by IB Roof Systems. All other penetration devices must receive prior approval by IB Technical Services Department.

Part 3 EXECUTION**3.0 EXAMINATION**

- A. Prior to roof installation, inspect substrates to ensure all penetrations, drainage outlets and flashings are in place and ready to receive roofing.
- B. Roof deck and flashing substrates must be clean, dry and properly secured. Existing substrates, flashings or materials scheduled for re-use must be carefully inspected and properly prepared to ensure they are suitable for incorporation into the new roof system, free of defects, contaminants or moisture.
- C. Examine substrates for deterioration, defects and entrapped or excess moisture. Wet or deteriorated decking shall be replaced or repaired prior to start of work. Fastener and / or adhesive pull tests should be conducted to confirm adequate condition and acceptable performance of decking.
- D. Ensure roof deck and building structure can support all loads associated with the proposed ballast / paver-surfaced roof assembly.
- E. Review work plan to avoid excess loading of roof areas during material transport, temporary storage, or during installation. Protect building components and fixtures from damage during work.

3.1 PREPARATION

- A. All surfaces shall be cleaned and primed where required prior to installation.
- B. Avoid construction traffic or work by other trades over completed roof sections. Where unavoidable, install adequate and properly secured temporary protection with tarps, plywood and / or layers of protective sheathing or insulation to avoid contamination and physical damage.
- C. Proper deck and substrate preparation are the responsibility of the contractor or building owner. Review manufacturer recommended preparation requirements and methods for specific project conditions and materials.
- D. Equipment, penetrations and supports scheduled for demolition or renovation should be completed prior to the start of work.
- E. Confirm flashing details, terminations and penetrations have adequate height or clearance to receive roofing materials and comply with manufacturer requirements.
- F. Review perimeter edge, penetration, and field flashing details for incorporation of locking paver clips, anchors, counter flashings, and ballast retention / drainage edge details where required.
- G. Review decking and substrates for the presence of above or below deck conduit, equipment, fixtures or structural elements that may interfere with roof installation.
- H. Recover and re-roofing installations require careful preparation and examination of existing decking, substrates, terminations, flashings, rooftop equipment and supports. Qualified review by a design professional is recommended where air or vapor retarders are present or required, where high interior humidity or cold storage conditions are present, or where potential exists for condensation to occur below or within the roof assembly.
 - 1. Inspect and clean all substrate surfaces to remove contaminants, bituminous materials, mastics, sealants, coatings, previous roofing and incompatible materials. Remove existing ballast, loose gravel and overburden materials.
 - 2. Prepared roof deck surfaces retaining excess contaminant or incompatible materials require review and approval of IB Technical Services and shall receive a separation layer of approved IB thermal insulation or cover board.
 - 3. Remove and replace areas of deteriorated decking. Steel decking exhibiting rust shall be inspected for condition and suitability to receive new materials. Repair areas of minor rusting with a rust inhibitor coating
 - 4. Existing vertical surfaces at walls and curbs retaining excess contaminant or incompatible materials require separation from new materials with a layer of plywood / OSB sheathing or approved cover board. IB separation sheets may be used for separation of existing substrates at mechanically attached base and wall flashings.
 - 5. Replace all deteriorated or damaged decking, supports, drains, sheet metal and wood blocking or nailers. Inspect drainage outlets for proper operation; replace broken or stripped drain bolts.
 - 6. Existing flashings, membranes, integrated sheet metal, drain leads and related accessories must be removed from perimeter edges, terminations, and penetrations. Confirm flashing substrates and conditions conform to IB Flashing Details and requirements.
- I. Re-roofing Installation: Remove all existing roof system components including ballast, surfacing/overburden materials, membranes, insulations, fasteners / anchors, flashings, sheet metal, copings, counter flashings, and penetration flashings.

1. Visual observation and fastener pull tests should be performed to confirm performance of the deck to meet IB Roof Systems and project requirements and may be required for issuance of IB Total System Warranties.
2. Direct adhesion of thermal insulation to existing substrates with bituminous or other material residue requires field uplift testing to confirm adequate adhesive and insulation securement.
3. Recover Installation: The new IB roofing system must be designed and installed in accordance with IB published specifications, and ballasted system details must be accepted by IB prior to installation to avoid any lessening of coverage of the IB Warranty term or cancellation of the IB Warranty if the PV system does not meet IB's minimum requirements.
4. Do not install roofing over existing roof assemblies or substrates containing moisture. Moisture surveys are recommended prior to installation of recover materials to avoid entrapment of moisture or infiltration of moisture into or beneath the new roof assembly.
5. Review existing roof system type and materials for compatibility and manufacturer's required separation or preparation prior to installation of new materials.
6. Existing adhered and mechanically attached single ply membranes left in place must be cut on 20' (6.1 m) centers in both directions. IB Loose-Laid Ballasted Roof Systems may be installed directly over approved and prepared existing roof systems with use of approved IB Separation or Fire Sheets in accordance with IB Specifications and Construction Details. IB Ballasted over Fully Adhered Roof Systems require a minimum layer of approved IB roof insulation or recover board, adhered to the prepared substrate as applicable. IB Ballasted over Fully Adhered Recover Roof Systems require a minimum layer of approved IB roof insulation or recover board, adhered to the prepared existing roof as applicable.
7. Visual observation, uplift testing and fastener pull tests should be performed to confirm adequacy of attachment of existing roof assembly and performance of the deck to meet project requirements and may be required for issuance of IB Total System Warranties.
8. Direct adhesion of IB roof insulations or approved IB PVC Fleece back membranes to prepared existing roof systems and substrates requires field uplift testing to confirm adequate adhesive and insulation securement. In-seam, cover bar or plate-bonded mechanically attached and loose-laid ballasted roof membranes are not acceptable for direct adhesion of IB recover roof systems.
9. Install IB One-Way Roof Vents at the rate of 1 per 1000 square feet over existing insulated roof assemblies.

3.2 SUBSTRATE PREPARATION

A. Structural Concrete Deck:

1. Deck shall be finished to a smooth uniform surface free of sharp edges, ridges, and irregular surfaces with minimum thickness of 4 (10.2 cm) inches.
2. Sumps, where provided for roof drains, shall be cast into the deck.
3. Cracks greater than of 1/8 (3.1 mm) inch in width must be repaired in accordance with the deck manufacturer's recommendations.
4. Roof deck shall be dry, free of frost or surface moisture and permitted to cure 28 days before start of roof system application. Underside shall be open and designed to allow adequate ventilation for drying with form materials removed. If there is any doubt to the dryness of the deck, evaluate surface moisture and deck dryness using ASTM D4263 test method.
5. Composite form concrete decks, decks with painted, insulated, or other condition restricting underside drying require review by IB Technical Services.
6. Primers, when used, must be allowed to dry prior to the application of insulation adhesive and balance of the roofing system.
7. Field uplift resistance testing of insulation adhesives is recommended to confirm acceptable roof system attachment and adhesive performance.

B. Steel Deck:

1. Minimum 22 gauge cold-formed steel decking with G-90 galvanized or minimum finish coat of primer paint on both sides. Galvanized steel decking where appropriate to project design criteria is recommended.
2. Inspect and repair areas of surface corrosion in accordance with deck manufacturer's recommendations. Replace damaged or deflected panels and deteriorated areas, securing loose or inadequately attached decking.
3. Install adequate support and framing at new and existing openings in deck.
4. Comply with applicable building codes, deck manufacturer and/or project required Factory Mutual gauge and span requirements in the current FM Approval Guide and Loss Prevention Data Sheets 1-28 and 1-29

C. Wood Plank:

1. Wood boards shall be kiln-dried with tongue and groove or splined edges, minimum 1" (25 mm) nominal thickness with nominal 4" to 6" (10.2 cm to 15.2 cm) minimum width.
 2. Lumber shall be dry, properly stored against weather and covered with the roofing assembly in a timely manner after installation.
 3. Boards shall be securely fastened with ends bearing on rafters or joists.
 4. Cover knotholes, and cracks greater than 1/4" (6.3 mm) with sheet metal securely fastened into position.
 5. Composite deck panels containing EPS/XPS polystyrene insulation are not suitable for use with solvent-based roof system adhesives.
- D. Plywood Deck:
1. Plywood sheathing shall be not less than 5/8" (16 mm) thick, minimum 4-ply construction conforming with C-D, Exposure 1 grade.
 2. Install deck over joists spaced 24" (61 cm) o.c. or less. Install deck with all sides bearing on and secured to joist and cross blocking. The panel must be secured in accordance with APA – The Engineered Wood Association recommendations. "H" clips are not acceptable.
 3. Composite deck panels containing EPS/XPS polystyrene insulation are not suitable for use with solvent-based roof system adhesives.
- E. Oriented Strand Board:
1. OSB Sheathing shall be not less than 5/8" (16 mm) thick, conforming with PS 2-10, Exposure 1, Structural 1 grade material.
 2. Install deck over joists spaced 24" (61 cm) o.c. or less. Install deck with all sides bearing on and secured to joist and cross blocking. The panel must be secured in accordance with APA – The Engineered Wood Association recommendations. "H" clips are not acceptable.
 3. Composite deck panels containing EPS/XPS polystyrene insulation are not suitable for use with solvent-based roof system adhesives.

3.3 WOOD NAILERS

- A. Wood Nailers: Install #2 or better solid wood nailers where required by project and manufacturer details. Minimum 1/2" (13 mm) plywood may be used in conjunction with solid wood nailers to fully shim or match insulation height.
- B. Nailers should be nominal 4" to 6" (10.2 cm to 15.2 cm) in width extending approximately 1/2" (13 mm) beyond perimeter metal edge flanges; mechanically secured to resist the required loads at perimeter edges and corners. Secure nailers with anchors / fasteners approved for the substrate using a minimum of two fasteners per nailer. Where anchors / fasteners are set into cement-filled masonry or concrete block, fastened into structural concrete, or secured to structural steel or wood framing members through an approved roof deck; perimeter nailer securement should be limited to 48" (1.22m) o.c. or less and 24" (1.22m) o.c. or less at corner regions. Fastening of nailers into steel or wood decking at perimeter edges without securement into underlying continuous blocking or structural framing may not result in adequate resistance. Where present and confirmed adequate to resist design loads, perimeter nailer securement should be located 12" (30.5 cm) o.c. staggered or less and 6" (15.2 cm) or less at corner regions.
- C. Where two or more nailers are required, attach second nailer to first sufficient to resist design loads with corrosion resistant fasteners installed a minimum of 12" (30.5 cm) o.c. staggered and 6" (15.2 cm) o.c. staggered within corner areas.

3.4 VAPOR RETARDER

- A. Where required by project details and conditions, install an IB approved vapor retarder assembly over the prepared substrate, thermal barrier, or minimal thickness of approved insulation board. Installation shall conform to the vapor retarder manufacturer, IB Roof Systems and applicable assembly approval and regulatory requirements. Surfaces to receive a vapor retarder shall be smooth, clean, and dry; primed where required with a primer approved by the vapor retarder manufacturer and IB Roof Systems. Allow primer to dry prior to membrane application.
- B. Seal all side and end laps, terminations and penetrations to form a weather-tight, permanent seal. Coordinate vapor retarder installation, detailing and integration into other building envelope components and / or existing vapor / air barrier assemblies. Prior to roof system installation, IB recommends the building owner, design professional and installer confirm project design, roof assembly and associated detail requirements including wind resistance, adequate thermal resistance and insulation, and the provision of adequate ventilation where

project conditions require use of a vapor retarder.

3.5 SEPARATION AND FIRE SHEETS

- A. Where required by project details install one or more layers of IB Fire Sheet 10, IB Separator Sheet, IB Poly or HD Poly Separator Sheets over the prepared substrate. Install separation and fire sheets in conformance with project design, regulatory and IB specification requirements.
- B. Lap sheets a minimum of 2" (5.1 cm) on sides and ends. Where two layers are required, install the second layer with all side and end laps offset a minimum of 12" (30.5 cm) from the first course. Fasten installed fire sheets with approved IB fastener and 3" (7.6 cm) Galvalume Insulation plates as required to hold in position.
- C. Fully adhered roof membrane and flashing applications require IB separation and fire sheets to be set below a minimum layer of approved IB thermal insulation or cover board.

3.6 THERMAL BARRIERS

- A. Install one layer of approved thermal barrier board over the prepared deck where required by local code, UL fire rated assembly or applicable roof system approval listing. For combustible decks, install one layer of UL classified minimum 1/2" (13 mm) gypsum board, 1/4" (6.3 mm) DensDeck Roof Board, 1/4" (6.3 mm) DEXcell Glass Mat Roof Board, 1/4" (6.3 mm) Securock Glass-Mat Roof Board, or 1/4" (6.3 mm) Securock Gypsum-Fiber Roof Board over the substrate.
- B. Thermal barrier board joints shall be staggered in one direction and offset a minimum of 6" (15.7 cm) from all joints in underlying plywood decks. Secure thermal barrier boards with approved fasteners in accordance with the requirements of the approved IB Roof System assembly.

3.7 INSULATION PLACEMENT

- A. Set insulation over the substrate with board edges fitted uniformly and closely together. Install insulation boards over steel decks with long dimension edges parallel to and bearing on ribs. Avoid joints or gaps greater than 1/4" (6.3 mm) and fill gaps greater than 1/4" (6.3 mm) with matching insulation material. Offset board joints a minimum of 12" (30.5 cm) in one direction from preceding course. For multiple layer installations, all joints must be staggered and offset both horizontally and vertically from preceding courses and layers.
- B. Do not install wet, damaged, or warped insulation boards.
- C. Where insulation board thickness is greater than 3" (7.6 cm) insulation should be installed in two layers.
- D. Fit and miter cut board edges at crickets, valleys, hips, ridges, and other changes in plane to provide a smooth transition and surface without voids. Install boards flush to the substrate, edges fully supported or bearing on deck ribs to avoid puncture or breakage.
- E. Install sumps with minimum 1/2" (13 mm) per foot factory tapered insulation panels at drains to provide a minimum 36" x 36" (0.91m x 0.91m) or larger sump area.
- F. Underlying roof insulations may be loose laid or secured to the substrate in accordance with project design and IB requirements for Ballasted or Paver-surfaced applications. Where required by project design, insulation may be fastened or adhered with IB Roof Systems approved insulation fasteners and stress plates, or IB insulation adhesive in accordance with IB specifications and project requirements.
- G. Do not install any more insulation than will be completely waterproofed each day.

3.8 INSULATION ATTACHMENT

- A. Loose Laid Insulation: Install insulation over the deck with boards butted tightly together with no joints or gaps greater than 1/4" (6.3 mm) and fill gaps greater than 1/4" (6.3 mm) with matching insulation material.
 - 1. Offset board joints a minimum of 12" (30.5 cm) in one direction from preceding course. For multiple layer installations, all joints must be staggered and offset both horizontally and vertically from preceding courses and layers.
 - 2. Ballasted IB Roof Assemblies should incorporate a cover board over the base layer of insulation. Cover board should be of sufficient density and compressive strength to provide adequate resistance to the over burden weight distribution calculated for the project.
- B. Adhered Insulation Attachment to Approved Substrates: Install one or more layers of IB insulation in approved IB insulation adhesive to the roof deck or over mechanically attached base layers of insulation in accordance with IB specifications. Insulation attachment shall meet or exceed IB Roof Systems requirements. Comply with design uplift pressures calculated under ASCE 7 and as required by local building codes or Authority Having

Jurisdiction.

1. Insulation layers installed in approved IB insulation adhesive shall be limited to maximum 4 feet by 4 feet (1.22m x 1.22m) board sizes. Install adhesive in 3/4" (18 mm) to 1" (25 mm) ribbons set a minimum of 12" (30.5 cm) o.c. or as required to meet project wind uplift resistance. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 12" (30.5 cm).
 2. Install insulation layers applied with adhesive applied at coverage rate necessary to achieve the specified attachment and uplift rating. Press each board firmly into place after adhesive has risen and activated, beginning to string when touched, but prior to skinning over or losing tack. Allow adequate open time prior to board installation for full activation and adhesive rise, typically one to two minutes after bead application, adjusted for weather conditions at time of installation. Roll boards with a weighted roller and apply temporary weight to ensure boards are in full, uniform contact with the applied adhesive until set.
- C. Mechanically Attached Insulation: Mechanically attached insulation is not recommended on Ballasted IB Roof Assemblies. Where used, insulation fasteners must be covered by a layer of IB approved insulation or cover board set in insulation adhesive. Secure the base layer of insulation to the deck with IB approved fasteners and insulation plates to meet or exceed IB Roof Systems requirements. Install roof assembly to comply with design uplift pressures calculated under ASCE 7 and as required by local building codes or the Authority Having Jurisdiction.
1. Install insulation with cross or short dimension joints staggered, with all joints staggered and offset between layers.
 2. Assemblies with air or vapor retarders require additional consideration of insulation fastening rates. Prior to installation, review applicable roof assembly securement requirements for required fastening density.

3.9 LOOSE-LAID BALLASTED / PAVER-SURFACED MEMBRANE APPLICATION

- A. Position PVC Single Ply Smooth or Fleece back membrane over the installed roof insulation or prepared substrate beginning from the low side of the roof. Install membrane either perpendicular or parallel to slope so that water runs over or with, but not against, membrane laps.
- B. Extend membrane over and below lower outside edge of perimeter edge nailers a minimum of 1" (25 mm) and fasten 12" o.c. (30.5 cm). Ballasted membrane application requires securement of the IB PVC membrane at terminations and penetrations a maximum of 6" (15.7 cm) o.c. At parapet walls, curbs, and other vertical terminations, fasten membrane to roof deck or turn up and terminate into approved substrate 6" o.c. through IB Aluminum Lip Termination Bar or IB barbed plates.
- C. Membrane Application: Ensure substrates are clean, dry, and properly secured in accordance with project requirements and IB specifications. Remove all debris, dirt, trash, or contaminants from surfaces prior to installation. Measure and mark courses as needed to maintain alignment and keep roll courses square to the overall roof deck and structure. Avoid contamination of membrane surfaces within the seam areas (side, end and flashing laps) during application of insulation adhesives. Ensure all seam areas are clean and free of debris or other contamination prior to welding. Use only IB Roof Systems recommended cleaning procedures and products where necessary to clean membrane prior to seaming or after completed installation.
 1. Install full-width membrane sheets throughout the roof.
 - a. Unroll and position IB PVC Single Ply smooth or IB PVC Single Ply fleece back membrane in place, allowing it to relax prior to seaming.
 - b. Remove all wrinkles, folds, and air pockets to ensure the membrane lays flat against the substrate.
 - c. Align membrane at side laps to provide a minimum 3" (7.6 cm) overlap.
 2. Position IB PVC Single Ply smooth membrane rolls to provide a minimum 3" (7.6 cm) overlap at end laps.
 3. Install IB PVC Single Ply fleece back membranes with rolls closely butted together on ends for cover strip application. Install a 6" (15.7 cm) wide strip of IB Cover Strip smooth membrane centered over the butt joint in accordance with IB Flashing Details. Continuously weld cover strip into position after completion and welding of membrane side laps.
 4. IB membrane side laps and seams shall be hot air welded using either an automatic hot air welding machine or hot air hand welder in accordance with IB Roof Systems specifications, flashing details and welding procedures. Follow all IB weld speed and temperature recommendations for IB membranes and pre-flashed accessories.
- D. Refer to BA-AT-07 for peel stop installation requirements. Where required, secure membrane with a peel stop in accordance with IB Construction Details, at angle changes greater than 2" (5.1 cm) per foot, and at transitions in membrane assembly or membrane configuration changes such as mechanically attached or fully adhered.

3.10 SEAM WELDING

- A. Minimum recommended weld widths for seams completed with an automatic hot-air welder is 1-1/2" (3.8 cm). Seams, laps and flashings completed with a hot-air hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Hand-welded seams and laps shall be rolled with a silicone roller during welding to ensure a continuous welded seam.
- B. Regular test welds shall be conducted during all hot-air welding operations to verify attainment of watertight, properly welded membrane laps and seams, and to adjust welding parameters and settings as required. IB recommends test weld samples be retained for review, dated, and labeled, as part of a thorough Quality Control program by the installer.
- C. Only install as much roofing in one day as can be seamed and completed to a watertight condition. Seam areas must be kept clean and free of contaminants, adhesives, dirt, or moisture. Clean spills and accidental seam contamination immediately before drying or setting occurs. **Avoid use of solvents to clean IB PVC Single Ply membranes or wipe down laps.** Follow IB recommended cleaning procedures for welding to existing weathered membrane or cleaning areas of contamination.
- D. Install IB Round T-Joint Patches at all T-joint locations in field laps and flashing seams on 80-mil membrane installations. Hot-air weld T-joint patches over the prepared seam intersections and laps in accordance with IB flashing details.
- E. All seams and laps shall be visually inspected and physically probed after they have set and cooled. Probe all seam areas to locate cold welds or presence of voids.
- F. Repair all seam defects and deficiencies the same day they are discovered.

3.11 FLASHING

- A. General: Refer to the General Requirements and IB Construction Details of this Manual, which outline and or depict flashing requirements for typical construction conditions. Install flashing materials as shown in the roofing details. Contact IB Technical Services for conditions not addressed in the IB Construction Details or for approval of alternative flashing options.
 1. IB Roof Systems requires installation of all roof construction details in accordance with published IB Construction Details utilizing IB manufactured and approved accessories, membranes and required components.
 2. IB Base and Wall Flashing Details are approved for use over a variety of substrates conforming with IB requirements including structural poured and precast concrete, masonry block, dimensional lumber, plywood, and oriented strand board sheathing, approved pre-manufactured metal curbs and IB supplied, approved gypsum cover boards.
 3. Wood and steel-framed walls shall be surfaced with approved plywood, OSB or IB approved gypsum cover board products designed for direct application of roofing materials. Framed walls with approved gypsum sheathing require provision of a suitable wood nailing strip or wood blocking for the termination and attachment of flashing membranes.
 4. Base flashings shall be constructed with IB reinforced membrane the same mil thickness as used in the field of roof and shall be installed as a separate component from installation of the field membrane. Field membrane courses may not be extended up vertical surfaces at base flashings and walls, except where alternate membrane terminations are incorporated at the base of the curb/wall.
 5. Minimum flashing height is 8" (20.3 cm).
 6. Base flashings and wall coverings may typically be installed either as Fully Adhered, Induction Welded, or Mechanically Attached in place and should conform to the height recommendations and limitations below. Insufficient height or termination of base flashings and penetrations below a roof's potential water accumulation depth, or where exposed to wind-driven rain or snow loads should be avoided. Sealants and caulks may be inadequate in preventing water entry under these conditions and will require periodic regular owner maintenance.
 7. Proper securement of IB Roof Systems field and flashing membranes is required to ensure adequate resistance to wind and other loads to which the roof system will be subjected. For standard IB Roof System installations, follow the following securement requirements for mechanical fastening of IB field of roof and flashing membranes at roof system terminations, penetrations, vertical intersections, walls, and perimeter edges.
 8. The maximum distance from the wall that horizontal mechanical attachment is installed is 6" (15.2 cm). For horizontal mechanical attachment beyond 6" (15.2 cm), move the attachment to the vertical substrate.

9. Use only IB supplied and approved fasteners, plates, anchors, and accessory products for the securement of IB membranes and flashing products.
10. Mechanically attached flashings shall be attached in accordance with IB Construction Details, published IB Specifications, and the following Flashing Securement Table.
11. Split / rough face concrete masonry block units are not suitable for direct flashing application. Smooth-faced units should be installed at areas to receive base and wall flashings with provision for through wall or reglet style counterflashing. Surface mount flashing terminations are not permitted at concrete masonry block wall substrate.
12. Walls clad with smooth, corrugated or standing seam metal panels, lap siding, hardboard, EIFS, stucco / cement finish or similar exterior claddings require the installed IB base flashing to extend up vertical surfaces behind the cladding with a minimum 2" overlap. Bottom edge of cladding or finish materials shall include provision of a sheet metal closure and counterflashing.
13. For occupied structures and projects where odor or fume control concerns exist, care should be taken during project planning to assess potential entry points into the structure. Consideration should be given to the use of compatible air / vapor barrier seals at openings of the roof deck, terminations, walls, and penetrations; and selection of construction details and low fume, reduced VOC, content adhesives and accessory products which are approved for the specific application.
14. Flashing of curbs, parapets, expansion joints, and other penetrations of the roof must be performed using approved IB PVC reinforced membrane and IB factory-manufactured accessories. Non-reinforced membrane may be used for flashing pipe penetrations, penetration pockets, and scuppers, as well as inside and outside corners, in accordance with IB details when the use of IB factory-manufactured accessories cannot be used or with prior approval from Technical.
15. Follow IB Flashing Details and procedures for all curb, wall, terminations, and penetration flashings including metal edging/coping and drainage outlets using IB manufactured and supplied accessories.
16. Tie-ins to sloped roof areas, transitions of roof plane or installation at valleys with slopes 2" in 12" or greater require termination and securement of the field membrane in accordance with IB Construction Details. Refer to IB Construction Details for additional requirements.
17. Install sheet metal in compliance with IB Flashing Details and SMACNA guidelines for type, grade and forming of seams.
18. Use only IB PVC clad coated metal stock formed metal edging and flashing components for construction of flashing details where welded membrane or welded flashing terminations to coated metal flanges are required.
19. All clad coated metal flashing corners and joints must be reinforced with an additional layer of IB NR 5" x 8" (12.7 cm x 20.3 cm) Metal Joint Patch or larger piece of NR Detail Flashing if required by joint size.
20. Surfaces with existing asphalt, coal tar, mastics, sprayed polyurethane foam or similar incompatible materials shall be removed, thoroughly cleaned, or separated from contact with new IB PVC flashings by a slip sheet, approved insulation or cover boards, or approved plywood, etc.
21. IB PVC ChemGuard is available with a variety of accessories specific to these membranes. Note: IB PVC ChemGuard® flashings and accessories are required for use with IB PVC ChemGuard® membranes.
22. DensGlass® board are NOT to be used as a substrate for fully adhered attachment on parapet walls, according to the manufacturer.
23. Conduits and wiring shall be properly secured and supported above the IB roof system on approved piping / conduit support details.
24. Wood blocking and wood nailers shall be provided where required by project details and in accordance with IB Construction Details.

3.12 FLASHING INSTALLATION

A. General Application Guidelines

1. Substrate surfaces shall be smooth, clean, dry, and properly secured in place, ready to receive flashing materials prior to the start of work.
2. Hand welding of flashing membrane and accessory laps and seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams and laps shall be probed after completion and adequate set time for watertight seam integrity and proper bond. Regular test welds prior to and during progress of work is an important part of project quality control and consistency in proper membrane seaming.
3. When using bonding adhesives, be sure to use the adhesive specific to membrane and follow ambient

weather conditions restrictions for use. Avoid contamination of lap and seam areas prior to welding with membrane or insulation adhesives, caulks, or primers.

4. All membrane flashing corners shall be reinforced with an additional layer of IB Inside / Outside corners or reinforcing membrane.
5. Remove and discard flashing materials or membrane used for temporary seals prior to completion of final flashing application.
6. Where tie-ins are required to new or existing air or vapor barriers and retarders, consult IB Technical Services and the specific material manufacturer for recommendations and requirements on required detailing.

B. Curbs:

1. Flashings can be installed either with adhesive applied to the membrane and substrate, or loose applied up to 18" (45.7 cm) high. IB Clad metal flashings must be fastened at 6" (15.2 cm) o.c.
2. Secure membrane flashing at the top edge with a termination bar, flat stock, or counter flashing. Apply a bead of IB Water Stop sealant between the curb surface and membrane flashing, and underneath all termination bars and surface mounted counter flashings. Exposed termination bars must be mechanically fastened 6" (15.2 cm) o.c. Termination bars that are counter flashed must be fastened 12" (30.5 mm) o.c.
3. If wood is present at the top of the curb, secure membrane to the inside of the curb using ring shanks nails 12" (30.5 cm) o.c. after wrapping the membrane to the inside of the curb. This can be used in lieu of the termination bar if nailed on the top or preferably the back side of the wood.
4. Roof field membrane must be fastened along the base of curbs, ducts, equipment supports, and field terminations a minimum of 6" (15.2 cm) o.c. with approved fasteners and barbed seam plates.

C. Parapets:

1. Flashings can be installed either with adhesive applied to the membrane and substrate, or loose applied up to 18" (45.7 cm) high. Maximum standard parapet wall height conditions are:
 - a. Mechanically Fastened Parapet Walls:
 1. Wall heights 18" (45.7 cm) or less, refer to Standard Mechanically Attached Wall Detail
 2. Wall heights exceeding 18" (45.7 cm), additional membrane sheets shall be installed and secured in horizontal row fashion 12" (30.5 cm) o.c.
 - b. Adhered Parapet Walls:
 1. Wall heights 60" (1.52m) or less, refer to Standard Adhered Wall Detail.
 2. Wall heights exceeding 60" (1.52m), the adhered membrane shall be additionally fastened in the vertical lap at in-seam spacing at 12" (30.5 cm) o.c. (Refer IB Construction Detail WD-02 Adhered Tall Wall).
2. For mechanically attached, loose laid flashing application install membrane with 5" side laps and 3" end laps. Fasteners and barbed seam plates shall be IB supplied, approved for the specific substrate type.
3. Secure membrane flashing at the top edge with a termination bar, counter flashing or metal cap flashing. Apply a bead of IB Water Stop sealant between the wall surface and membrane flashing, and underneath all termination bars and surface mounted counter flashings. Exposed termination bars must be mechanically fastened 6" (15.2 cm) o.c. Termination bars that are counter flashed must be fastened 12" (30.5 cm) o.c.
4. Roof membrane must be mechanically attached along the base of walls and field terminations a minimum of 6" (15.2 cm) o.c. with approved fasteners and barbed seam plates.
5. Metal counter flashings with fully adhered membrane wall flashings are required on warranty terms longer than 20 years. (They are not required for warranty term lengths of 20 years or less.) All termination bars, either exposed or covered, must be sealed with Solar Seal 900 Caulk or IB Sealer.
6. Metal cap flashings must have continuous cleats or be face-fastened 12" (30.5 cm) o.c. on both the inside and outside of the walls.

D. Adhered Base and Wall Membrane Flashings:

1. The thickness of the flashing membrane must be the same as the thickness of the roofing membrane.
2. For fully adhered application, install membrane with 3" end and side laps using only IB adhesives approved for vertical substrate installations. Follow all IB requirements and recommendations for acceptable environmental conditions and temperatures and required application rates. Application during colder weather requires special attention to material storage and handling, and typically requires longer open times for adhesive set-up and curing.
3. Adhesive application rates will vary according to the porosity and condition of the substrate surface. A light prime coat of adhesive or manufacturer's approved primer may be required particularly at concrete and masonry block surfaces prior to application of primary flashing membrane adhesive. Where required, allow prime coat to dry thoroughly.

4. When using IB Vertibond Adhesive, IB Vertibond 432 Bonding Adhesive or Polyset PVC Spray Contact Adhesive, the following substrates are generally suitable: new primed gypsum roof board; Type X gypsum board, cement roof board, properly prepared structural concrete (absent of curing and sealing compound); new or properly prepared OSB (untreated), new or properly prepared CDX plywood (untreated), wood board curbs (untreated), and dry, sound masonry (absent of curing or sealing compounds).
5. Apply IB Vertibond Adhesive or IB Vertibond 432 Bonding Adhesive in accordance with IB specifications and requirements at the following application rates:
 - a. Substrate must be clean, dry, firm, free of loose particles, and free of dust, grease, and mold release agents. Protect surfaces not to be adhered.
 - b. IB Vertibond Adhesive or IB Vertibond 432 Bonding Adhesive: Apply as contact adhesive to both the underside of the membrane and to approved vertical substrates at the approximate rate of one (1) gallon per 60 square feet of net applied coverage area. Allow the adhesive sufficient open time to achieve a dry substrate / tacky on back of membrane condition. Dry condition is tacky without stringing to a dry finger touch.
 - c. Press or roll flashing membranes to vertical surfaces immediately after installation to ensure full contact eliminating air pockets and wrinkles.
 - d. Follow all cold weather and applicable handling procedures and do not apply when ambient or substrate temperatures are below 40°F (4.4°C). Do not use during inclement weather, on wet surfaces or on any roof deck showing signs of deterioration or loss of structural integrity. Do not use after the expiration date. Please note: IB Vertibond Adhesive and IB Vertibond 432 Bonding Adhesive should not be used and is not compatible for use with Expanded (EPS) and Extruded (XPS) Polystyrene board substrates.
 - e. Avoid application or contamination of seam areas and laps with bonding adhesive. Clean and remove all contaminants immediately and before final welding and completion of the seam.
 - f. A thin prime coat of additional adhesive may be required over rough or porous surfaces such as masonry or block walls. Allow adhesive prime coats to dry fully prior to application of membrane materials and bonding adhesives.
6. Apply Polyset PVC Spray Contact Adhesive in accordance with IB specifications and requirements at the following application rates:
 - a. Substrate must be clean, dry, firm, free of loose particles, and free of dust, grease, and mold release agents. Protect surfaces not to be adhered.
 - b. Polyset® PVC Spray Contact Adhesive: Follow manufacturer's guidelines and application instructions for use. The following are basic instructions when using the Polyset® PVC Spray Contact Adhesive. Apply as adhesive to both the underside of the membrane and to approved vertical substrates with an adhesive pattern at 90° angles (opposite direction) to each other. (Example: Spray one substrate vertically and spray the other substrate horizontally). Apply a consistent and thorough coat of adhesive at approximately 1,000 sq. ft. net applied coverage (both surfaces) per kit. Extra coverage is recommended at substrate edge. Allow the adhesive open time to a dry substrate / tacky on back of membrane condition. Dry condition is tacky without stringing to a dry finger touch.
 - c. Press or roll flashing membranes to vertical surfaces immediately after installation to ensure full contact eliminating air pockets and wrinkles.
 - d. A thin prime coat of additional adhesive may be required over rough or porous surfaces such as masonry or block walls. Allow adhesive prime coats to dry fully prior to application of membrane materials and bonding adhesives.
 - e. Follow all cold weather and applicable handling procedures and do not apply when ambient or substrate temperatures are below 40°F (4.4°C). Do not use during inclement weather, on wet surfaces or on any roof deck showing signs of deterioration or loss of structural integrity. Do not use after the expiration date. Note: Polyset® PVC Spray Contact Adhesive should not be used and is not compatible for use with Expanded (EPS) and Extruded (XPS) Polystyrene board substrates.
 - f. Follow IB Flashing Details and procedures for all wall and curb flashings substituting Polyset Spray Contact Adhesive in lieu of IB Vertibond Contact Adhesive in applicable conditions.
 - g. Wear protective glasses with side shields or goggles, nitrile gloves, and clothing that protects against dermal exposure. Recommend dispensing product in a well-ventilated area with certified respiratory protection; however, well ventilated exterior applications may not need respiratory protection.
 - h. It is the responsibility of the employer to complete a PPE evaluation and/or exposure assessment to determine if respiratory protection is required. Read all instructions, ICP Product Stewardship

Guidelines, and SDS (Section 8) prior to use of any product. For additional information go to www.polysetadhesives.com.

E. Perimeter Edge Flashings:

1. Perimeter edge details should be installed in accordance with ANSI / SPRI ES-1 and applicable local code requirements. Continuous metal cleats one gauge heavier than the edge metal or as required for pre-manufactured IB edge systems shall be installed along perimeter edges. As an alternate, IB PVC clad edge metal may be externally fastened in accordance with IB Construction Details with approved fasteners.
2. PVC Clad Metal is applicable for both drip edge and gravel stop conditions as well as the exterior edges of parapet walls. PVC Clad Metal constructed of galvanized metal may be used for warranties up to 20 years. For extended length warranties (25 years, 30 years or greater; use IB PVC Clad Drip Edge or IB PVC Clad Gravel Stop of Stainless-Steel construction or IB pre-manufactured Metal-Era fascia and coping systems only.
3. Roof edge flashings constructed with IB coated metal are secured through the metal flanges nailed 4" (10.2 cm) o.c. staggered or using IB HD #14 Fasteners at 12" (30.5 cm) o.c. into wood nailers. Then heat-weld an 6" (15.2 cm) IB Cover Strip to metal flanges and field membrane.
4. Form exposed edge metal flanges with a 1/2" (13 mm) hem formed where applicable for use with a continuous metal cleat. Clad metal termination bars and miscellaneous metal flashings should be formed with fully closed 1/2 (13 mm) hems with or without caulk lip kick-out as required.
5. Flashings formed from PVC clad metal for perimeter drip edge, gravel guard edge, 90° or other transitions, clad metal termination bars and similar linear lengths of metal flashing require sealing of butt-joints in accordance with published IB Butt-Joint Details. Install metal flashings with a 1/4" (6.3 mm) gap between ends to allow for expansion. Seal joint with application of a 2" (5.1 cm) strip of foil bond-breaker tape and cover with a minimum 5" (12.7 cm) wide strip of non-reinforced IB PVC membrane centered over the joint and extending down the outside face prior to application of final reinforced flashing strip-in membrane.
6. Perimeter Edge Metal Wall Closures, 90° flashings with inside/outside corners and similar constructions shall be formed to provide a continuous clad metal flange with all overlapping joints sealed, riveted, and covered with a strip of non-reinforced membrane prior to application of reinforced flashing membrane.
7. Lapped PVC clad perimeter edge metal and similar metal flashing butt-joints are susceptible to fatigue and splitting of flashing and / or field membranes at these locations due to movement and expansion of metal flashings. IB Roof Systems does not recommend use of lapped butt-joint details nor warrants against leaks or damage caused by metal movement.
8. A ballast/gravel bar may also be used in lieu of drip or gravel stop type details. Ballast/gravel bars supplied by other manufacturers must be installed per IB Construction Details or by ballast/gravel bar manufacturer's instructions. These gravel bars are approved for the length of the guarantee.

F. Manufactured Edge Systems (Anchor-Tite):

1. Note: For extended length warranties (25 years, 30 years or greater; use IB PVC Clad Drip Edge or IB PVC Clad Gravel Stop of Stainless-Steel construction or IB pre-manufactured Metal-Era fascia and coping systems only.
2. IB PVC field membrane or wall flashing membrane shall be turned over the roof edge or parapet wall and down outside face of wall extending past bottom of wood nailer a minimum of 1/2" (13 mm).
3. Outside edge of wood nailer(s) must be aligned flush with or extend slightly past outermost edge of wall.
4. Follow any applicable pre-installation and post installation requirements of the manufacturer's edge system design requirements.
5. Install edge system or coping system per manufacturer's installation and securement instructions. Comply with design uplift pressures calculated under ASCE 7 and as required by local building codes or Authority Having Jurisdiction.
6. Important: Remove protective film immediately upon installation.

G. Pipe Flashings:

1. Install pipe penetration flashings around pipes and circular penetrations using IB PVC Pipe Flashings, Split Pipe Flashings, No-Cone Pipe Flashings, or IB Custom Pipe Flashings. Terminate and secure field membrane near the base of the penetration 6" (15.2 cm) o.c. with a minimum of 3 fasteners and plates for pipes less than 12" (30.5 cm) diameter, and 12" (30.5 cm) o.c. with a minimum of 4 fasteners and plates for penetrations larger than 12" (30.5 cm) in diameter. Mark and trim cone flashings to an opening size smaller than the pipe outside diameter to provide a 1/2" (13 mm) or wider flared top edge when set and drawn down over the pipe. Slide the flashing over penetration and center. Flared upper edge of cone flashing must fit tightly against the pipe without gaps or voids. Heat weld perimeter edge of the target sheet to field

membrane. Apply stainless steel banding clamp and seal with a continuous bead of approved IB sealant around the top of the completed penetration. Probe and repair all non-welded areas.

2. Where required for irregular size or pipe flashings with greater than an 8" (20.3 cm) diameter, contact IB Roof Systems for assistance with custom pipe flashing requirements. Where custom flashings are not available from IB, field fabricated no-cone pipe flashing details may be constructed from reinforced IB membrane target sheets with non-reinforced upper membrane in accordance with IB Construction Details.

H. Pitch Pans or Penetration Pocket Pans:

1. Where used, install IB PVC Clad Pitch Pans and fill pans with IB approved Sealant / Filler for pitch pans. IB Pitch Pans must be secured in place over the installed IB membrane with IB Fasteners approved for the substrate type. Split pan seams must be sealed with a continuous bead of M-1 Sealant and closed with a pop-rivets spaced approximately 1" (25 mm) o.c. (not supplied).
2. Fill sealant pans with IB One-Part Pourable Sealant or IB Sealer. Pans may be partially filled with non-shrink quick-set grout, allowing a 2" (5.1 cm) minimum thickness of IB One-Part Pourable Sealant or IB Sealer and filled to the very top or overfill the pocket.
3. Pitch pan sealant will require periodic inspection and regular owner maintenance.
4. Solid soldered stainless steel sheet metal cap flashings above the pans are recommended to reduce owner required sealant maintenance.

I. Irregular Shaped Penetrations:

1. Where irregularly shaped supports are not suitable for pipe or curb flashing application, install IB PVC Clad Pitch Pans and fill pans with IB approved Sealant / Filler for pitch pans. IB Pitch Pans must be secured in place over the installed IB membrane with IB Fasteners approved for the substrate type. Split pan seams must be sealed with a continuous bead of M-1 Sealant and closed with a pop-rivets spaced approximately 1" (25 mm) o.c. (not supplied).
2. Fill sealant pans with IB One-Part Pourable Sealant or IB Sealer. Pans may be partially filled with non-shrink quick-set grout, allowing a 2" (5.1 cm) minimum thickness of IB One-Part Pourable Sealant or IB Sealer and filled to the very top or overfill the pocket.
3. Pitch pan sealant will require periodic inspection and regular owner maintenance.
4. Solid soldered stainless steel sheet metal cap flashings above the pans are recommended to reduce owner required sealant maintenance.

J. Hot Exhaust Stacks & Hot Pipe Vents:

1. Hot pipe and similar hot exhaust vents with operating / surface temperatures above 120°F (48.9°C); require the use of an approved IB Hot-Pipe Flashing Detail. Install an insulated metal jacket or curb flashing with separate sheet metal rain collar prior to application of IB PVC pipe flashing. As an alternate, an insulated metal curb may be installed with sheet metal cap flashing.

K. Dryer / Exhaust Vents:

1. For dryer, kitchen, and bath exhaust vents use IB Dryer Exhaust Vents. Connect vent pipe to exhaust below deck. Tighten hose clamp at pipe connection, apply duct tape where both pipes connect, if necessary, to prevent any exhaust leakage. Secure the metal flange of the vent to the roof deck with a minimum of 4 fasteners using appropriate IB Fasteners for deck type. Install provided IB No Cone Flashing over the exhaust pipe and hot-air weld the perimeter of the target flashing to the field membrane with a minimum 1-1/2" (3.8 cm) weld to provide a watertight seal. Install the vent hood over the pipe and tighten clamp to secure into place.
2. **Note: Not intended for use over plumbing vents, furnaces, chimneys, water heater or other gas-fired equipment, or roof ventilation purposes.**

L. Drains:

1. Roof drains shall be cast iron or minimum 11 gauge or heavier spun aluminum type for new installations manufactured with integral clamping rings and strainers.
2. Sump areas approximately 36" x 36" (0.91m x 0.91m) for primary drains and 36" x 48" (0.91m x 1.22m) for primary / overflow drain sets, should be formed into the deck, or constructed with tapered insulation to facilitate drainage and water removal from the roof. Sump area shall be tapered a minimum of 1/2" (13 mm) per foot and shall not exceed 3" per horizontal foot slope.
3. Drain flashings shall be installed in accordance with IB Construction Details with a seamless drain target sheet. Field membrane shall be terminated around the drain and fastened 12" (30.5 cm) o.c. with IB fasteners and barbed seam plates.
4. Insulation and substrate surfaces should be tapered and sumped to drains and outlets. Flash drains with a reinforced, smooth back target sheet in accordance with IB Flashing Details. Do not extend field or flashing

seams through roof drain flashings or beneath clamping rings. Secure target sheet around drain sump fastened a minimum of 6" (15.7 cm) o.c. with approved fasteners. Make small cuts or holes around drain bolts and seal underside of target flashing to prepared drain flange in a continuous bed of IB Water Stop sealant. Install clamping ring to provide a watertight compression seal. Cut an opening in the membrane directly above and slightly wider than the drain opening with a minimum of 1/2" (13 mm) past inside edge of drain bolts.

M. Retrofit Drains:

1. IB Aluminum Retrofit Drain with a factory applied IB reinforced membrane target flashings are available for use in most new construction and retrofit drain applications. There are two types of models. The 2" (5.1 cm) Retro-fit drains are supplied with an expandable foam tape that seals to the existing drainpipe forming a compression seal. Larger diameter Retro-fit drains incorporate a Pro-Seal expansion gasket that requires the use of a Pro-Seal screwdriver to tighten gasket to create a water-tight connection to the existing drainpipe.
2. Select appropriate drain to connect to or fit inside of the existing drainpipe.
3. Retro-fit drain with expandable tape:
4. For Retro-fit drain models with expandable tape the installer removes the exterior restraining tape and immediately sets the retro drain in place. The released tape gradually expands to fill the space between the Retro-fit drain and the existing drain sleeve making the connection watertight. Direct-connect design utilizes flexible expansion-type connectors to prevent failure from movement of roof deck or drain.
5. The Retro-fit drains may be set in a shallow bowl or directly on roof membrane with deck opening of at least 1" (25mm) greater than the leader size into which the drain will be inserted. The flange is adaptable to all membranes.
6. Secure the drain flange to the roof deck using a minimum of four IB Fasteners that are evenly spaced around the flange. The flashing membrane must cover and extend past the fastener head.
7. Flash drain flange in accordance with membrane manufacturer's instructions. Hand welding of flashing membrane seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams shall be probed after completion and adequate set time for watertight seam integrity and proper bond.
8. Install Aluminum Strainer in accordance with manufacturer's instructions.

N. Retro-fit drain with Pro-Seal Gasket:

1. Insert Pro-Seal into end of drain stem and tighten screws enough to hold the seal in place during installation. Insert assembled Retro-fit Drain into existing drainpipe until flange is flush on roof membrane.
2. Alternately tighten seal compression ring screws with Pro-Seal Screwdriver until hand tight. Retro-fit Drain body is correctly installed when pressure placed on drain body results in no vertical movement. **Do not overtighten the screws.**
3. Secure the drain flange to the roof deck using a minimum of four IB Fasteners that are evenly spaced around the flange. The flashing membrane must cover and extend past the fastener head.
4. Flash drain flange in accordance with membrane manufacturer's instructions. Hand welding of flashing membrane seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams shall be probed after completion and adequate set time for watertight seam integrity and proper bond.
5. Install Aluminum Strainer in accordance with manufacturer's instructions.

O. Scuppers:

1. There are three typical styles of IB PVC Clad Scuppers: Standard Through Wall Scupper, Standard Overflow Through Wall Scupper and Through Wall Box Scupper with Drop Drain & Overflow Cut-Out. Each style is made to order as a custom scupper.
2. Metal through-wall scuppers shall be installed over the completed base and wall flashing assembly. A wood nailer is required at the juncture of the deck and wall for securement of the scupper flange to the deck. Scupper flanges shall be secured using a minimum of two IB Fasteners per flange that are appropriate for the specific substrate.
3. Hand welding of scupper target flashing membrane seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams shall be probed after completion and adequate set time for watertight seam integrity and proper bond.
4. Apply a bead of Solar Seal 900 or IB Sealer to the scupper box at the outside wall face.
5. Mechanically attached base and wall flashings require separate securement 6" (15.7 cm) o.c. through IB Aluminum Termination Bar around perimeter edge of scupper opening prior to placement and securement

of the clad metal scupper.

P. Blocking and Equipment Supports:

1. Use of appropriate grade and type round structural pipe supports in lieu of irregularly shaped penetrations such as c-channel, angle iron, I-beam, or Unistrut type channels, angles or beams are recommended to facilitate use of standard pipe flashings. Penetration supports subject to regular movement or vibration such as at equipment stands, screen walls, or other elevated rooftop equipment should be flashed with IB U-Anchor Flashing Systems.
2. IB U-Anchors are customized to fit roof top conditions and provide anchorage and equipment support solutions that are compatible with the IB PVC roof membrane
3. Wood support blocking, typically 4" x 4" (10.2 cm x 10.2 cm), is usually installed under light-duty or temporary roof mounted equipment, such as electrical conduit, gas lines, and condensation and drain lines.
4. Place wood blocking on oversized IB PVC Membrane Isolation Pad, fold two sides vertically, and fasten with roofing nails into the blocking.

Q. Expansion Joints:

1. Roof expansion joint details may be field fabricated to meet expansion joint needs. There are three typical expansion joint construction styles: a curb-to-curb style set 8" (20.3 cm) or more above the roof or installed with an approved low profile, or canted profile style directly to the roof surface into the structure support or wood nailers.
2. Field construction of expansion joints consists of a membrane retainer sheet, expansion joint filler, foam backer rod, and an IB membrane cover strip.
3. Expansion joints should be set in a continuous line extending fully through the edge of the roof with approved wood nailers secured along both sides of the joint.
4. Temporary construction ties at expansion joints must be removed. Do not install roof insulation or membrane materials directly across joint openings.
5. Provide watertight detailing and functional integration of the expansion joint with other roof flashings and termination details at expansion joint terminations, intersections, and closures.
6. Protection of the finished roof assembly is recommended with expansion joint cross-over access installed at walkways and where service work is expected to reduce the potential for foot traffic and equipment damage.
7. Avoid expansion joint construction and placement that restricts or prevents the free flow of water to outlets. Do not block or intersect drainage outlets and valley lines or attempt to route roof drainage over an installed expansion joint.
8. Roof membrane must be mechanically attached along the base of the expansion joint with screws and plates a minimum of 12" (30.5 cm) o.c.
9. The retainer sheet must extend from one side of the expansion joint to the other and cover the secured field membrane on each side of the joint, extending past the fastener plate sufficiently to provide specified welded seam width of a minimum of 1.5" (3.8 cm).
10. The retainer sheet shall be secured along to the wood nailer or the top of the raised wood curb a minimum of 6" (15.2 cm) o.c.
11. The cavity of the expansion joint is filled with expansion joint filler (specified by others). The expansion joint bellows must be a minimum of one and one-half times larger than the width of the expansion joint opening to allow for sufficient expansion / contraction.
12. An additional layer of IB membrane, is loose laid over the expansion bellows and then welded to the membrane retainer sheet.
13. Hand welding of flashing membrane seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams shall be probed after completion and adequate set time for watertight seam integrity and proper bond.

R. U-Anchor Solar Array Support System:

1. Depending on engineering requirements determined by others, the U-Anchor may be required to be secured to structural supports. Install the U-Anchor as per instructions provided by Anchor Products. Follow any applicable pre-installation and post installation requirements according to the engineered design.
2. Hand welding of the U-Anchor PVC flashing membrane seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams shall be probed after completion and adequate set time for watertight seam integrity and proper bond.
3. Attach the solar system mounting bracket and assembly to the U-Anchor posts as per instructions provided by Anchor Products.

- S. U-Anchor Pipe Support System:
 - 1. Depending on engineering requirements determined by others, the U-Anchor may be required to be secured to structural supports. Install the U-Anchor as per instructions provided by Anchor Products. Follow any applicable pre-installation and post installation requirements according to the engineered design.
 - 2. Hand welding of the U-Anchor PVC flashing membrane seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams shall be probed after completion and adequate set time for watertight seam integrity and proper bond.
 - 3. Secure the pipe support mounting bracket and assembly to the U-Anchor posts as per instructions provided by Anchor Products.
- T. Pipe Supports:
 - 1. Conduits and piping shall be properly secured and supported above the completed roof on approved support details. Surface-mounted supports bearing on the membrane surface shall be installed over a course of IB WalkTread™ or IB approved protection pad.
- U. Satellite Dish Supports:
 - 1. Install satellite dish support bases over a protective layer of minimum 60-mil IB PVC membrane or IB WalkTread™ which is to be continuously perimeter welded to the field membrane in accordance with IB Flashing Details.
- V. U-Anchor Satellite Support Securement System:
 - 1. Depending on engineering requirements determined by others, the U-Anchor may be required to be secured to structural supports. Install the U-Anchor as per instructions provided by Anchor Products. Follow any applicable pre-installation and post installation requirements according to the engineered design.
 - 2. Hand welding of U-Anchor PVC flashing membrane seams by means of a hand welder shall maintain a minimum 1-1/2" (3.8 cm) weld width. Flashing seams shall be probed after completion and adequate set time for watertight seam integrity and proper bond.
 - 3. Secure the satellite dish mounting bracket and assembly to the U-Anchor as per instructions provided by Anchor Products.
 - 4. Secure the base of the dish as per instructions provided by Anchor Products.
- W. Lightning Protection Clips:
 - 1. Lightning protection base / clips shall be limited to designated locations over a minimum 3" (7.6 cm) wide IB PVC flashing membrane strips which is continuously perimeter heat-welded to the roof membrane.
 - 2. The lightning protection base / clips shall be adhered to the membrane strip using a generous bead of M-1 Sealant, IB Sealer, or another compatible sealant.

3.13 SEPARATION SHEET FOR BALLASTED / PAVER SURFACING

- A. Install IB Poly Separator or HD Poly Separator Sheet over the completed field membrane prior to application of ballast or pavers. Position sheets lapping 6" (15.7 cm) on sides and ends.
- B. Extend separation sheet 2" (5.1 cm) up curbs, walls, supports and other vertical penetrations to the height of installed ballast or pavers. Install sheets trimmed to edge of drains and outlets so that storm water runoff is not restricted. Apply ballast or paver surfacing immediately after application of separator sheet to hold in position.
- C. Re-use of existing stone ballast requires prior approval of IB Technical Services and at least one layer of IB Poly Separator Sheet or IB HD Poly Separator Sheet.
- D. A layer of IB HD Poly Separator Sheet is required under pavers weighing more than 20 lbs. / sq. ft.
- E. Walkways, service areas, roof access locations, and areas utilizing heavy pavers for perimeter ballast requires an additional layer of IB HD Poly Separator Sheet.

3.14 WALKWAYS

- A. Clean the membrane prior to walkway pad installation at locations designated to receive walkways. Provide manufacturers walkway pads at roof access points, ladders, hatches, stairs, doorways, areas of foot traffic, and around rooftop equipment requiring periodic maintenance.
- B. IB WalkTread™ where required shall be continuously perimeter welded to the membrane in accordance with IB Flashing Details. Do not install walk treads directly over completed seams. Hold back walk tread edges a minimum of 3" (7.6 cm) on either side of a completed membrane or flashing seams to allow for drainage.
- C. Walkway pad installation must be monitored to avoid overheating the underlying membrane or walk tread while welding in place. Probe welds to ensure adequate bond to membrane surfaces.
- D. Do not install IB WalkTread™ within the defined perimeter and corner zones. Concrete pavers must be used

in lieu of ballast and/or walk tread.

- E. The total walkway utilizing IB WalkTread™ on a loose-laid ballasted roof should not exceed two (2) percent of the total roof area.

3.15 BALLAST AND PAVER INSTALLATION

- A. Ballast shall be smooth, river bottom stone conforming with gradation requirements of ASTM D7655 / D7655M. Heavyweight individual concrete pavers and interlocking extruded lightweight pavers may be used as an alternate to stone ballast when approved by IB Technical Services.
 - 1. Ballast and pavers shall be installed as required to meet project wind uplift and design criteria, and the requirements of the local Authority Having Jurisdiction. Refer to design recommendations contained in accordance with ANSI / SPRI RP-4 Wind Design Standard for Ballasted Single Ply Roof Systems.
 - 2. Install stone ballast or approved concrete pavers uniformly and evenly over the field of roof and within Perimeter and Corner Zones using the appropriate gradation and/or weight in accordance with project details, building height, location and construction height of parapet walls. Final surfacing should be applied immediately upon application of each roof area, installed in conjunction with required IB Separator Sheets to avoid the need for temporary ballast and potential for wind uplift.
 - 3. Excess traffic and movement of heavy wheeled carts during ballast and surfacing application over completed roof membrane areas may damage the roof and underlying insulation. Install traffic protection as required to avoid damage.
 - 4. IB Total System warranty projects utilizing IB PVC Ballasted Roof Systems require the following minimum applications of stone ballast in the field of roof. Additional ballast may be required depending on specific project requirements.
 - I. #4 Ballast: Nominal 1-1/2" (38mm); applied at 10 lbs. per square foot (49 kg/sq. m.).
 - II. #2 Ballast: Nominal 2-1/2" (63 mm); applied at 13 lbs. per square foot (64 kg/sq. m.).
 - 5. Perimeter and Corner Zones require minimum installation of #2 Ballast applied at 1300 lbs. per 100 square feet (64 kg/sq. m.).
 - 6. Ballast and separator sheet at completed membrane and flashing laps and seams must be held back to permit inspection by IB Technical Field Representatives on IB Total System warranty projects.
- B. Approved heavyweight standard concrete pavers weighing a minimum of 22 lbs. per square foot (108 kg/sq. m.) may be used as an alternate to #2 and #4 ASTM D7655 / D7655M ballast on warranted IB roof assemblies. Pavers must be smooth finished with integral drainage channels or design to avoid restriction of flow of water to drains and outlets.
- C. Lightweight extruded interlocking pavers weighing a minimum of 10 lbs. per square foot (49 kg/sq. m.) may be used when installed in accordance with the paver manufacturer's tested assembly. Proposed interlocking paver assemblies and paver assemblies utilizing field-installed anchors require prior review and approval of IB Technical Services.
- D. Paver assemblies require coordination of perimeter angle clips, paver clips, locking hold-down clips and anchors with the installed IB Roof Systems membrane and flashings. **Paver clips and anchors fastened through or penetrating completed IB membranes and flashings are not acceptable without written approval of IB Technical Services.**
- E. Paver assemblies set on pedestals may be used when installed in accordance with the paver manufacturer's tested assembly. Pedestal feet must be set on an additional layer of welded IB PVC membrane of larger size than the pedestal diameter.

BALLAST SCHEDULE FOR BUILDINGS < 15 FT IN HEIGHT¹			
Risk Category I or II, Exposure B urban, suburban. Exposure C rural locations. No exposure D or coastal locations			
Parapet Height	Field	Perimeter	Corner
< 36" (0.9m)	#4 Ballast (Nom.1-1/2") @ 10 lbs. / sq. ft.	#4 Ballast (Nom.1-1/2") @ 13 lbs. / sq. ft.	#4 Ballast (Nom.1-1/2") @ 13 lbs. / sq. ft.
> 36" (0.9m)	#4 Ballast (Nom.1-1/2") @ 10 lbs. / sq. ft.	#4 Ballast (Nom.1-1/2") @ 10 lbs. / sq. ft.	#4 Ballast (Nom.1-1/2") @ 10 lbs. / sq. ft.
BALLAST SCHEDULE FOR BUILDINGS > 15 FT TO < 35 FT IN HEIGHT¹			
Risk Category I or II, Exposure B urban, suburban. Exposure C rural locations. No exposure D or coastal locations			
Parapet Height	Field	Perimeter	Corner
< 36" (0.9m)	#4 Ballast (Nom.1-1/2") @ 10 lbs. / sq. ft.	#2 Ballast (Nom.2-1/2") @ 13 lbs. / sq. ft.	#2 Ballast (Nom.2-1/2") @ 13 lbs. / sq. ft.
> 36" (0.9m)	#4 Ballast (Nom.1-1/2") @ 10 lbs. / sq. ft.	#4 Ballast (Nom.1-1/2") @ 13 lbs. / sq. ft.	#4 Ballast (Nom.1-1/2") @ 13 lbs. / sq. ft.
BALLAST SCHEDULE FOR BUILDINGS > 35 FT IN HEIGHT			
Contact IB Technical Services for prior approval			
PAVER SCHEDULE FOR BUILDINGS < 35 FT IN HEIGHT			
Risk Category I or II, Exposure B urban, suburban. Exposure C rural locations. No exposure D or coastal locations			
Parapet Height	Field	Perimeter	Corner
< 36" (0.9m)	Interlocking Pavers @ 22 lbs. / sq. ft.	Interlocking Pavers @ 22 lbs. / sq. ft.	Interlocking Pavers @ 22 lbs. / sq. ft.
> 36" (0.9m)	Interlocking Pavers @ 10 lbs. / sq. ft.	Interlocking Pavers @ 10 lbs. / sq. ft.	Interlocking Pavers @ 10 lbs. / sq. ft.
PAVER SCHEDULE FOR BUILDINGS > 35 FT IN HEIGHT TO 60 FT IN HEIGHT			
Risk Category I or II, Exposure B urban, suburban. Exposure C rural locations. No exposure D or coastal locations			
Parapet Height	Field	Perimeter	Corner
< 36" (0.9m)	Contact IB Technical Services for prior approval		
> 36" (0.9m)	Interlocking Pavers @ 22 lbs. / sq. ft.	Interlocking Pavers @ 22 lbs. / sq. ft.	Interlocking Pavers @ 22 lbs. / sq. ft.
PAVER SCHEDULE FOR BUILDINGS > 60 FT IN HEIGHT			
Contact IB Technical Services for prior approval			
¹ Approved lightweight interlocking concrete pavers or heavyweight standard concrete pavers are acceptable alternatives for # 2 and # 4 ballast.			

3.16 DAILY SEALS

- Install night seals as temporary closure to prevent moisture infiltration at membrane terminations and flashings that cannot be finished by the close of each day. Remove temporary seals prior to next day's work to avoid contamination or damage to the completed membrane.
- Remove and replace areas that are damaged, wet, or contaminated prior to continuation of work. Clean and prepare seams in accordance with IB recommendations.
- Clean temporary sealant materials from deck and flashing substrates and prepare surfaces to receive permanent roofing and flashing materials.

3.17 CLEAN UP AND PROTECTION

- During installation, keep all work surfaces clean and free of dirt and debris. Remove excess materials, trash, cartons, loose fasteners, tools, and debris from the roof daily. Dispose of waste material, packaging, and debris in accordance with project requirements and applicable regulatory requirements.
- Avoid contamination of finished membrane surfaces. Install protective materials and tarps as necessary to protect completed roof areas from damage. Remove adhesive spills, residue, and other contaminants immediately before drying or setting up.
- IB recommends contractor pre-inspection of the completed installation in advance of a requested IB final inspection. Pre-inspection should include review of all project details, drainage outlets, inspection of laps and seams, sheet metal work, sealants, and caulks.
- Avoid construction traffic or material staging over completed membrane areas. Install protective tarping and plywood secured against wind and the elements to prevent membrane contamination and physical damage from other trades or work.

END OF SECTION