**GUIDE SPECIFICATION**

**Paratech Roof Membrane System**

**Self-Adhesive Base/Cap in Adhesive**

**Substrate - Insulation**

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This specification is provided as a general guide for use of Siplast products based on typical building conditions and standard roofing practices. Siplast is strictly a manufacturer of roofing systems and has no experience, training or expertise in the areas of architecture/engineering or in the area of consulting with respect to matters related to such areas. Siplast recommends that the Owner's representative independently verify the accuracy and appropriateness of a specification provided for a specific project.

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SECTION 07 52 16 MODIFIED BITUMINOUS MEMBRANE ROOFING (Rev 11/28/2023)

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Substrate Panel Application

B. Temporary Roof Application

C. Insulation Application

D. Roof Membrane Application

E. Roof Flashing Application

1.02 RELATED SECTIONS

A. Section [-----] - Submittals

B. Section [-----] - Rough Carpentry

C. Section [-----] - Roof Decks

D. Section [-----] - Sheet Metal Flashing Components and Roofing Accessories

E. Section [-----] - Sheet Metal Flashing and Trim

F. Section [-----] - Roof Specialties

G. Section [-----] - Temporary Roofs/Vapor Retarder

\* NOTE: A vapor retarder can be an important component in roof systems where climatic and building interior conditions require the prevention of vapor condensation within the roof assembly.

1.03 REFERENCE STANDARDS

References in these specifications to standards, test methods, codes etc., are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions, and societies which may be used as references throughout this specification section.

ASTM American Society for Testing and Materials

Philadelphia, PA

FM Factory Mutual Engineering Research Corp.

Norwood, MA

NRCA National Roofing Contractors Association

Rosemont, IL

OSHA Occupational Safety and Health Administration

Washington, DC

UL Underwriters Laboratories

Northbrook, IL

1.04 SUBMITTALS

All submittals which do not conform to the following requirements will be rejected.

\* NOTE: Coordinate submittal requirements with general provisions. Modify submittals to suit specific project requirements.

A. Submittals Prior to Contract Award:

1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the Manufacturer's requirements in order to qualify the project for the specified guarantee.

1.05 QUALITY ASSURANCE

A. Acceptable Products: Provide primary roofing products, including each type of sheet, all manufactured in the United States, supplied by a single manufacturer. Provide secondary or accessory products which are acceptable to the manufacturer of the primary roofing products.

\* NOTE: Coordinate the desired fire and windstorm rating with the Underwriters Laboratories Roofing Materials and Systems Directory and the relevant independent wind uplift testing agency.

B. Agency Approvals: The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.

1. Underwriters Laboratories Class [-----] acceptance of the proposed roofing system.

2. Evidence by an accredited independent testing agency or agencies that the roof configuration meets a design windload pressure of - [---] psf or greater.

C. Project Acceptance: Submit a completed manufacturer's application for roof guarantee form along with shop drawings of the roofs showing all dimensions, penetrations, and details.

D. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractor's Association, amended to include the acceptance of a phased roof system installation.

E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

F. Manufacturer Requirements: The primary roofing materials manufacturer shall provide direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conduct a final inspection upon successful completion of the project.

1.06 PRODUCT DELIVERY STORAGE AND HANDLING

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: Store materials out of direct exposure to the elements. Store roll goods on a clean, flat and dry surface. All material stored on the roof overnight shall be stored on pallets. Rolls of roofing must be stored on ends. Store materials on the roof in a manner so as to preclude overloading of deck and building structure. Store materials such as solvents, adhesives and asphalt cutback products away from open flames, sparks or excessive heat. Cover all material using a breathable cover such as a canvas. Polyethylene or other non-breathable plastic coverings are not acceptable.

C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, and will require removal and replacement at the Contractor's expense.

1.07 PROJECT/SITE CONDITIONS

A. Requirements Prior to Job Start

1. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.

2. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.

B. Environmental Requirements

1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.

2. Temperature Restrictions – self-adhesive sheets: The minimum required substrate temperature at point of application is 60F (15C). Maintain a minimum roof membrane material temperature above 60F (15C). In low temperature conditions, materials should be kept warm prior to application. Suspend application in situations where the self-adhered base ply cannot be kept at temperatures allowing for proper adhesion.

3. Temperature Restrictions - cold adhesive: At low temperatures, the specified cold adhesive becomes more viscous, making even distribution more difficult. The optimal temperature of the adhesive at point of application is 70° - 100°F (21° - 38°C). To facilitate application when ambient temperatures are below 50F (10C), store the adhesive and roll goods in a warm place immediately prior to use. Bulk warmers, inline heaters, or other pre-heating equipment should be used to maintain the proper viscosity of the adhesive when using mechanical application equipment. Consider "flying in” the pre-cut roofing sheets in by placing them into the adhesive rather than rolling them into position. Roll or broom the sheets to ensure contact with the underlying adhesive. Suspend application in situations where the adhesive cannot be kept at temperatures allowing for even distribution.

C. Protection Requirements

1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.

2. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.

3. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.

1.08 GUARANTEE

\* NOTE: Choose the guarantee type below as appropriate for the type of coverage desired. “Membrane/System” includes the Siplast Paratherm insulation system and related accessories.

A. Roof Membrane Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's ***[10, 15, or 20]*** year labor and materials membrane guarantee. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner.

> Siplast ***[10, 15, or 20]*** -year Roof Membrane Guarantee

B. Roof Membrane/System Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's ***[10, 15, or 20]*** year labor and materials guarantee covering the insulation, insulation fasteners/plates, insulation adhesive and roof membrane/flashing system. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner.

> Siplast ***[10, 15, or 20]*** -year Roof Membrane and Insulation Guarantee

PART 2 PRODUCTS

2.01 ROOFING SYSTEM ASSEMBLY/PRODUCTS

A. Substrate Panel/Thermal Barrier: Panels shall be UL and FM approved. Panels shall be approved in writing by the manufacturer for intended use and for use with the specified roof assembly.

1. Gypsum Sheathing Panel: A non-structural gypsum panel composed of fiber reinforced synthetic gypsum. Provide panels having a nominal thickness of [---] inch. Acceptable types are as follows:

> Securock Gypsum-Fiber Roof Board by United States Gypsum; Chicago, IL

2. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of [---] inch. The panel surface shall be factory primed with a non-asphaltic primer. Acceptable types are as follows:

> DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

3. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of [---] inch. The panel surface shall be factory primed with a non-asphaltic primer. Acceptable types are as follows:

> DEXcell® FA Glass Mat Roof Board by National Gypsum, Charlotte, NC

B. Temporary Roof/Vapor Retarder

1. Self-Adhesive Modified Bitumen Ply Sheet: A fiberglass reinforced, styrene butadiene-styrene modified asphalt coated sheet having a self-adhesive bitumen layer on the back surface and a minimum weight of 49 lb/sq designed specifically for use as a vapor retarder/temporary roof.

> Siplast Paratech Glass SA

2. Self-Adhesive Modified Bitumen Ply Sheet: A fiberglass reinforced, styrene butadiene-styrene modified asphalt coated sheet having a self-adhesive bitumen layer on the back surface, a polyolefin release film, and a nominal weight of 95 lb/sq.

> Siplast Paratech Glass Base SA 2.5

C. Roof Insulation: Roof insulation shall be UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Maintain a maximum panel size of 4 feet by 4 feet where polyisocyanurate insulation and cover panels are specified to be installed in insulation adhesive.

1. Polyisocyanurate: A closed cell, polyisocyanurate foam core material, integrally laminated between glass fiber reinforced organic facers *[polymer bonded glass fiber facers]*, in full compliance with ASTM C1289, Type II, Class 1 *[Class 2]*, Grade 2 (20 psi) *[Grade 3 (25 psi)]*. Panels shall have a nominal thickness of [--] inches. Acceptable types are as follows:

> Paratherm by Siplast; Dallas, TX

2. Polyisocyanurate Tapered Roof Insulation: Tapered panels and standard fill panels composed of a closed cell, polyisocyanurate foam core material, integrally laminated between glass fiber reinforced organic facers *[polymer bonded glass fiber facers]*, in full compliance with ASTM C1289, Type II, Class 1 *[Class 2]*, Grade 2 (20 psi) *[Grade 3 (25 psi)]*. The tapered system shall provide for a roof slope of [---] inch per foot. Acceptable types are as follows.

> Tapered Paratherm by Siplast; Dallas, TX

3. Gypsum Sheathing Panel: A non-structural gypsum panel composed of fiber reinforced synthetic gypsum. Provide panels having a nominal thickness of [---] inch. Acceptable types are as follows:

> Securock Gypsum-Fiber Roof Board by United States Gypsum; Chicago, IL

4. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of [---] inch. The panel surface shall be factory primed with a non-asphaltic primer. Acceptable types are as follows:

> DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

5. Gypsum Sheathing Panel: A highly durable, reinforced panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of 5/8 inch. The panel surface shall be factory primed with a non-asphaltic primer, . Acceptable types are as follows:

> DensDeck StormX Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

6. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of [---] inch. The panel surface shall be factory primed with a non-asphaltic primer. Acceptable types are as follows:

> DEXcell® FA Glass Mat Roof Board by National Gypsum, Charlotte, NC

7. Fiberboard: A high density panel composed of interlocking wood fibers and waterproofing binders, having a top surface that is pre-treated with a paraffin-based coating. Fiberboard panels shall be in full compliance with ASTM C208, Type II, Grade 2, and ASTM C209 (water absorption - 10% volume maximum) requirements. Panels shall have a nominal thickness of [--] inch. Acceptable types are as follows:

> Structodek HD by Blue Ridge Fiberboard, Inc.; Danville, VA

8. High Density Polyisocyanurate: A closed cell, polyisocyanurate foam core material, integrally laminated between polymer bonded glass fiber facers, in full compliance with ASTM C1289, Type II, Class 4, Grade 1 (80 psi). Panels shall have a nominal thickness of 1/2 inch. Acceptable types are as follows:

> Paratherm HD by Siplast; Dallas, TX

9. Tapered Edge Panels: A tapered panel composed of polyisocyanurate or expanded volcanic minerals combined with waterproofing binders. The top surface shall be pre-treated with an asphalt based coating. The panels shall have a dimension sufficient to provide for a smooth transition and provide proper support for the membrane layer or subsequent layer of insulation when there are transitions of 1/4 inch or greater.

2.02 DESCRIPTION OF SYSTEMS

\* NOTE: For Item A, choose the base and finish membrane plies in accordance with the project design requirements (ASTM D6163 or ASTM D6164 criteria).

A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Reinforcement mats shall be impregnated/saturated and coated each side with SBS modified bitumen blend. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.

> Siplast Paratech Roof System

1. Fiberglass Mat Reinforced Modified Bitumen Self-Adhesive Base and Flashing Reinforcement Ply, manufactured in accordance with ASTM D6163 Type I, Grade S criteria.

> Paratech Glass Base SA 2.5 by Siplast; Dallas, TX

2. Fiberglass Mat Reinforced Modified Bitumen Stripping Ply, manufactured in accordance with ASTM D6163 Type I, Grade S criteria.

> Paratech Glass Base by Siplast; Dallas, TX

\* NOTE: For Item 3, choose one of the following finish ply options to meet the desired design criteria.

3. Fiberglass Mat Reinforced Modified Bitumen Finish Ply, manufactured in accordance with ASTM D6163 Type I, Grade G criteria.

> Paratech Glass Cap FR by Siplast; Dallas, TX

3. Polyester Mat Reinforced Modified Bitumen Finish Ply, manufactured in accordance with ASTM D6164 Type I, Grade G criteria.

> Paratech 180 Cap FR by Siplast; Dallas, TX

3. Polyester Mat Reinforced Modified Bitumen Finish Ply, manufactured in accordance with ASTM D6164 Type II, Grade G criteria.

> Paratech 250 Cap FR by Siplast; Dallas, TX

B. Flashing Membrane: A flashing membrane consisting of a prefabricated, reinforced Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Reinforcement mats shall be impregnated/saturated and coated each side with SBS modified bitumen blend.

\* NOTE: For Item 1, choose one of the following flashing ply options to meet the desired design criteria.

1. Adhesive-applied Polyester Mat Reinforced Modified Bitumen Flashing Ply, manufactured in accordance with ASTM D6164 Type I, Grade G criteria.

> Paratech 180 Cap FR by Siplast; Dallas, TX

1. Adhesive-applied Polyester Mat Reinforced Modified Bitumen Flashing Ply, manufactured in accordance with ASTM D6164 Type II, Grade G criteria.

> Paratech 250 Cap FR by Siplast; Dallas, TX

C. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a PMMA-based, fully reinforced membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.

> Parapro 123 Flashing System by Siplast; Dallas, TX

2.03 ROOFING ACCESSORIES

A. Insulation Adhesives

1. Insulation Adhesive: A single component, moisture cured, polyurethane foam adhesive, dispensed from a portable, pre-pressurized container used to adhere insulation panels to the substrate, as well as to other insulation panels.

> Para-Stik Insulation Adhesive by Siplast; Dallas, TX

2. Insulation Adhesive: A dual component, polyurethane foam adhesive used to adhere insulation panels to the substrate, as well as to other insulation panels.

> Parafast Insulation Adhesive by Siplast; Dallas, TX

B. Roofing Adhesives

1. Membrane Cold Adhesive: An asphalt, solvent blend conforming to ASTM D4479, Type II requirements.

> Siplast Paratech Adhesive by Siplast; Dallas, TX

2. Mastic: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D4586 Type II requirements.

> Siplast PA-1021 Plastic Cement by Siplast; Dallas, TX

3. Flashing Adhesive: A slump resistant, asphalt cutback flashing adhesive, reinforced with non-asbestos fibers, conforming to ASTM D4586 Type II requirements.

> Siplast PA-828 Flashing Cement

4. Non-toxic Membrane Adhesive: A single component, non-toxic modified asphalt adhesive designed for application of the specified roof membrane system.

> Siplast SFT Adhesive by Siplast; Dallas, TX

5. Flashing Adhesive: A single-component, modified adhesive. The adhesive blend shall be formulated in a grade for application of flashing materials.

> Siplast SFT Cement by Siplast; Dallas, TX

C. Primers

1. Primer: An asphalt/solvent blend meeting ASTM D41, South Coast Air Quality District and Ozone Transport Commission requirements.

> PA-917 Primer by Siplast; Dallas, TX

2. Primer: An asphalt, solvent blend conforming to ASTM D41 requirements.

> PA-1125 Asphalt Primer by Siplast; Dallas, TX

3. Primer for Self-Adhesive Sheets: A quick drying, low-VOC, water-based, high-tack primer specifically designed to promote adhesion of roofing and waterproofing sheets to approved substrates. Primer shall meet South Coast Air Quality District and Ozone Transport Commission requirements.

> Siplast TA-119 Primer by Siplast; Irving, TX

D. Sealant (horizontal applications): A moisture-curing, self-leveling elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials. Acceptable types are as follows:

> PS-209 Elastomeric Sealant by Siplast; Dallas, TX

E. Sealant (vertical and horizontal applications): A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials. Acceptable types are as follows:

> PS-715 NS Elastomeric Sealant by Siplast; Dallas, TX

F. Ceramic Granules: No. 11 grade specification ceramic granules of color scheme matching the granule surfacing of the finish ply.

G. Perlite Cant Strips: A cant strip composed of expanded volcanic minerals combined with waterproofing binders. The top surface shall be pre-treated with an asphalt based coating. The face of the cant shall have a nominal 4 inch dimension.

H. Fasteners

1. Insulation Fasteners: Insulation fasteners and plates shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. Acceptable insulation fastener manufacturers for specific deck types are listed below.

a) Metal Decks: Insulation mechanical fasteners for metal decks shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable insulation fastener types for metal decks are listed below.

- A fluorocarbon coated screw type roofing fastener having a minimum 0.220 inch thread diameter. Plates used in conjunction with the fastener shall be a metal type having a minimum 3 inch diameter, as supplied by the fastener manufacturer.

> Parafast Fastener by Siplast; Dallas, TX

> Standard RoofGrip Drill Point Fastener by OMG; Agawam, MA

b) Wood/Plywood Decks: Insulation mechanical fasteners for wood/plywood decks shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable insulation fastener types for wood/plywood decks are listed below.

- A fluorocarbon coated screw type roofing fastener having a minimum 0.220 inch thread diameter. Plates used in conjunction with the fastener shall be a metal type having a minimum 3 inch diameter, as supplied by the fastener manufacturer.

> Parafast Fastener by Siplast; Dallas, TX

> Standard RoofGrip Drill Point Fastener by OMG; Agawam, MA

c) Structural Concrete Decks: Insulation mechanical fasteners for structural concrete decks shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable insulation fastener types for structural concrete decks are listed below.

- A fluorocarbon coated non-threaded, hammer-driven roofing fastener. Plates used in conjunction with the fastener shall be a metal type, having a minimum 3 inch diameter, specifically manufactured for use with the structural concrete fastener.

> Parafast CD-10 Fastener by Siplast; Dallas, TX

> CD-10 by OMG; Agawam, MA

- A fluorocarbon coated screw type roofing fastener having a minimum 0.245 inch thread diameter. Plates used in conjunction with the fastener shall be a metal type having a minimum 3 inch diameter, as supplied by the fastener manufacturer.

> Parafast HD Fastener by Siplast; Dallas, TX

> Heavy Duty Roofing Fastener by OMG; Agawam, MA

d) Cementitious Wood Fiber Decks: Acceptable insulation fastener types for wood cement fiber decks are listed below.

- A single unit, precision formed, fluorocarbon coated screw type roofing fastener having a minimum 0.310 inch diameter shank and a minimum 0.710 inch diameter head. The corresponding plate used shall be a metal type, having a minimum 3 inch diameter, specially manufactured for use with the screw fastener.

> Parafast LD Fastener with Parafast 3 inch plates by Siplast; Dallas, TX

> Lite-Deck Fasteners with G-90 3 inch plates by OMG; Agawam, MA

2. Flashing Reinforcing Sheet Fasteners for Wood/Plywood Substrates to Receive Flashing Coverage: Fasteners shall be approved by the manufacturer of the primary roofing products. Acceptable fasteners for specific substrate types are listed below.

a) Wood/Plywood Substrates

* A 12 gauge, spiral or annular threaded shank, zinc coated steel roofing fastener having a minimum 1 inch head.

> Hot-Dip Galvanized Square Cap by Maze Nails; Peru, IL

> Simplex Cap Nail by Simplex Nails, Inc., Americus, GA

\* NOTE: Contact Siplast for further information regarding approved base sheet fasteners for specific substrates.

I. Walktread: A prefabricated, puncture resistant polyester core reinforced, polymer modified bitumen sheet material topped with a ceramic-coated granule wearing surface.

1. Thickness: 0.217 in (5.5 mm)

2. Weight: 1.4 lb/ft² (6.8 kg/m²)

3. Width: 30 in (76.2 cm)

> Paratread by Siplast; Dallas, TX

PART 3 EXECUTION

3.01 PREPARATION

\* NOTE: Edit this section to address specific job conditions which may affect the scope of work.

A. General: Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

B. Asphaltic Primer: Prime metal and concrete and masonry surfaces with a uniform coating of the specified asphalt primer.

3.02 SUBSTRATE PREPARATION

\* NOTE: See the Siplast Insulation and Base Sheet Usage Guide for information regarding approved insulation and applicable installation methods.

\* NOTE: Select the substrate panel fastening frequency, if applicable, to meet project-specific design criteria.

A. Substrate Panel/Thermal Barrier: Install substrate panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions. Install only as much panels as can be made watertight within the same work day.

1. Substrate Panel: Mechanically attach the panel to the substrate, using the specified fasteners, at a rate of 1 fastener per [--] square feet of panel area ([----] per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof and mechanically attach the corners at the rate of 1 fastener per 1 square foot of panel area (32 per 4-foot by 8-foot panel).

\* NOTE: Select the temporary roof application method if one is incorporated into the specified roofing configuration.

B. Self-Adhesive Applied Temporary Roof/Vapor Retarder: Adhere sheets directly to the substrate, free of wrinkles, creases or fishmouths. Unroll the self-adhesive sheet, and set the roll into place utilizing minimum 3 inch side and end laps. Fold one end of the roll back onto itself by 24 inches. Peel the release film off of the back of the 24 inch end section of the sheet and lay into place, pressing the 24 inch end section of the sheet firmly into place over the substrate. Pull the release film free from the underside of the remainder of the sheet while pressing the material into place with a follow tool as the film is being removed, leaving the end laps un-adhered. Prior to adhering the end laps, cut a dog ear angle at each end lap on overlapping selvage edges. Adhere end laps in the specified adhesive and apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet. Laps of the base ply must not be left un-adhered overnight.

C. Insulation: Install insulation panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions. Where insulation is installed in two or more layers, stagger joints between layers. Maintain a maximum panel size of 4 feet by 4 feet for polyisocyanurate insulation andcover panels applied in insulation adhesive. Install only as much insulation as can be made watertight within the same work day.

\* NOTE: Select the applicable insulation fastening frequency to meet project-specific design criteria.

1. Insulation - single layer: Mechanically attach the insulation panels, using the specified fasteners, at a rate of 1 fastener for every [--] square feet of panel area ([----] per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof and fasten the corners at the rate of 1 fastener per 1 square foot of panel area (32 fasteners per 4-foot by 8-foot panel).

2. Insulation - single layer: Install insulation panels in an application of the specified insulation adhesive in 3/4- to 1-inch wide beads spaced 12 inches on center in the field of the roof, 6 inches on center at the perimeter of the roof, and 4 inches on center in the corners of the roof. Follow the requirements and guidelines of the insulation adhesive manufacturer/supplier. Stagger the panel joints between insulation layers.

3. Insulation - double layer: Mechanically attach both layers simultaneously to the substrate, using the specified fasteners, at a rate of 1 fastener per [--] square feet of panel area ([----] per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof and fasten the corners at the rate of 1 fastener per 1 square foot of panel area (32 fasteners per 4-foot by 8-foot panel). Stagger the panel joints between insulation layers.

4. Insulation - double layer: Mechanically attach the bottom layer, using the specified fasteners, at a rate of 1 fastener per [--] square feet of panel area ([----] per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof and fasten the corners at the rate of 1 fastener per 1 square foot of panel area (32 fasteners per 4-foot by 8-foot panel). Set the second layer in an application of the specified insulation adhesive in 3/4- to 1-inch wide beads spaced 12 inches on center in the field of the roof, 6 inches on center at the perimeter of the roof, and 4 inches on center in the corners of the roof. Follow the requirements and guidelines of the insulation adhesive manufacturer/supplier. Stagger the panel joints between insulation layers.

5. Insulation - double layer: Install both layers in an application of the specified insulation adhesive in 3/4- to 1-inch wide beads spaced 12 inches on center in the field of the roof, 6 inches on center at the perimeter of the roof, and 4 inches on center in the corners of the roof. Follow the requirements and guidelines of the insulation adhesive manufacturer/supplier. Stagger the panel joints between insulation layers.

6. Insulation - multiple layer: Mechanically attach the insulation layers simultaneously to the substrate, using the specified fasteners, at a rate of 1 fastener per [--] square feet of panel area ([----] per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof and fasten the corners at the rate of 1 fastener per 1 square foot of panel area (32 fasteners per 4-foot by 8-foot panel). Stagger the panel joints between insulation layers.

7. Insulation - multiple layer: Mechanically attach the base layers simultaneously to the substrate, using the specified fasteners, at a rate of 1 fastener per [--] square feet of panel area ([----] per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof and fasten the corners at the rate of 1 fastener per 1 square foot of panel area (32 fasteners per 4-foot by 8-foot panel). Set the top layer of insulation in an application of the specified insulation adhesive in 3/4- to 1-inch wide beads spaced 12 inches on center in the field of the roof, 6 inches on center at the perimeter of the roof, and 4 inches on center in the corners of the roof. Follow the requirements and guidelines of the insulation adhesive manufacturer/supplier. Stagger the panel joints between insulation layers.

8. Insulation - multiple layer: Install all layers in an application of the specified insulation adhesive in 3/4- to 1-inch wide beads spaced 12 inches on center in the field of the roof, 6 inches on center at the perimeter of the roof, and 4 inches on center in the corners of the roof. Follow the requirements and guidelines of the insulation adhesive manufacturer/supplier. Stagger the panel joints between insulation layers.

9. Crickets: Construct crickets of tapered insulation panels in a layout as indicated on the roof plan.

10. Tapered Edge at Transitions: Field-cut, shape and install tapered edge strip at transitions of 1/4 inch or greater between substrate components to provide a smooth transition and proper support for the subsequent insulation layer or membrane/flashing system components.

3.03 ROOF MEMBRANE INSTALLATION

\* NOTE: This specification is limited to projects having a maximum roof slope of 2.5 inches. Contact Siplast for specifications to meet higher slope requirements.

A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of insulation as a continuous operation.

B. Aesthetic Considerations: Construction of an aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials including granules, and exercise care in ensuring that the finished application is acceptable to the Owner.

C. Membrane Adhesive Application: Membrane adhesive can be applied by roller, squeegee or spray unit. Apply cold adhesive in a smooth, even, continuous layer without breaks or voids. Utilize an application rate of 2 to 2 1/2 gal/sq (0.6 to 1.0 l/m²) over irregular or porous substrates. Utilize an application rate of 1 1/2 to 2 gal/sq (0.6 to 0.8 kg/m²) for interply applications. Double the adhesive application rate at the end laps of granule surfaced sheets. Refer to the manufacturer’s inter-ply flashing detail at the locations that are to receive the specified catalyzed acrylic resin primer/flashing system.

D. Bitumen Consistency: Cutting or alterations of bitumen, primer, and sealants will not be permitted.

E. Roofing Application: Apply all layers of roofing free of wrinkles, creases or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.

*\* NOTE: Use the following items 1-3 for applications incorporating sheets applied perpendicular to the slope of the roof.*

1. Apply all layers of roofing perpendicular to the slope of the deck.

2. Unroll the base ply, and set the roll into place utilizing minimum 3 inch side and end laps. Fold one end of the roll back onto itself by 24 inches. Peel the release film off of the back of the 24 inch end section of the sheet and lay into place, pressing the 24 inch end section of the sheet firmly into place over the substrate. Pull the release film free from the underside of the remainder of the sheet while pressing the material into place with a follow tool as the film is being removed, leaving the end laps unadhered.  Place a straight 2"x6" or larger board adjacent to the modified bitumen sheet overlap to help reduce lifting of the overlapping sheet beyond the selvage area, inhibiting the potential for entrapped air during hot air welding.  Lay the board such that the hot air welder nozzle does not extend into the overlap beyond the specified lap width.  Hot air weld the side laps using a robotic welder in accordance with the manufacturer's guidelines. Prior to adhering the end laps, cut a dog ear angle at each end lap on overlapping selvage edges. Adhere end laps in the specified adhesive and apply top pressure to top seal T-laps immediately following sheet application. Alternatively end laps can be hot air welded following the same procedure for side laps. Stagger end laps a minimum of 3 feet. Laps of the base ply must not be left un-adhered overnight. In cases where rapid onset of inclement weather occurs, all exposed lap edges should be hot air welded.

3. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps.  Apply each sheet directly behind the cold adhesive applicator.  Apply the adhesive in a full coating, extending completely up to the selvage edge of the adjacent course of roof membrane to be overlapped, taking care to keep the adhesive off of the selvage lap that will be hot air welded.  Place a straight 2"x6" or larger board adjacent to the modified bitumen sheet overlap to help reduce lifting of the overlapping sheet beyond the selvage area, inhibiting the potential for entrapped air during hot air welding.  Lay the board such that the hot air welder nozzle does not extend into the overlap beyond the specified lap width.  Hot air weld the side laps using a robotic welder in accordance with the manufacturer's guidelines.  Cut a dog ear angle at the end laps on overlapping selvage edges.  Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application.  Stagger end laps a minimum of 3 feet.  Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply.  Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.

*\* NOTE: Use the following items 1-3 in for applications incorporating sheets applied parallel to the slope of the roof.*

*1. Apply all layers of roofing parallel to the slope of the deck.*

*2. Unroll the base ply, and set the roll into place utilizing minimum 3 inch side and end laps. Fold one end of the roll back onto itself by 24 inches. Peel the release film off of the back of the 24 inch end section of the sheet and lay into place, pressing the 24 inch end section of the sheet firmly into place over the substrate. Pull the release film free from the underside of the remainder of the sheet while pressing the material into place with a follow tool as the film is being removed, leaving the end laps unadhered.  Place a straight 2"x6" or larger board adjacent to the modified bitumen sheet overlap to help reduce lifting of the overlapping sheet beyond the selvage area, inhibiting the potential for entrapped air during hot air welding.  Lay the board such that the hot air welder nozzle does not extend into the overlap beyond the specified lap width.  Hot air weld the side laps using a robotic welder in accordance with the manufacturer's guidelines Prior to adhering the end laps, cut a dog ear angle at each end lap on overlapping selvage edges. Adhere end laps in the specified adhesive and apply top pressure to top seal T-laps immediately following sheet application. Alternatively end laps can be hot air welded following the same procedure for side laps. Stagger end laps a minimum of 3 feet. Laps of the base ply must not be left un-adhered overnight. In cases where rapid onset of inclement weather occurs, all exposed lap edges should be hot air welded.*

*3. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps.  Apply each sheet directly behind the cold adhesive applicator.  Apply the adhesive in a full coating, extending completely up to the selvage edge of the adjacent course of roof membrane to be overlapped, taking care to keep the adhesive off of the selvage lap that will be hot air welded.  Place a straight 2"x6" or larger board adjacent to the modified bitumen sheet overlap to help reduce lifting of the overlapping sheet beyond the selvage area, inhibiting the potential for entrapped air during hot air welding.  Lay the board such that the hot air welder nozzle does not extend into the overlap beyond the specified lap width.  Hot air weld the side laps using a robotic welder in accordance with the manufacturer's guidelines.  Cut a dog ear angle at the end laps on overlapping selvage edges.  Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application.  Stagger end laps a minimum of 3 feet.  Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply.  Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.*

4. Maximum sheet lengths and special fastening of the specified roof membrane system may be required at various slope increments where the roof deck slope exceeds 1/2 inch per foot. The manufacturer shall provide acceptable sheet lengths and the required fastening schedule for all roofing sheet applications to applicable roof slopes.

F. Granule Embedment: Broadcast mineral granules over all bitumen overruns on the finish ply surface, while the bitumen is still hot or the adhesive is soft, to ensure a monolithic surface color.

G. Adhesive-applied Flashing Application - Masonry Surfaces: Flash masonry parapet walls and curbs using the reinforcing sheet and the flashing membrane. Fully adhere the reinforcing sheet to the substrate. Incorporate minimum 3 inch laps; extending the sheets a minimum of 3 inches onto the base ply surface and 3 inches up the parapet wall above the cant. Terminate the finish ply at the top of the cant. Cut the flashing membrane into lengths that can be easily handled. Apply a uniform coat of the specified flashing cement to the area to receive flashing coverage. Set the flashing in place while exerting pressure on the flashing sheet to ensure complete contact with the wall/roof surfaces and to prevent air pockets. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers.

H. Adhesive-applied Flashing Application – Wood/Plywood Surfaces: Flash wood/plywood parapet walls and curbs using the reinforcing sheet and the flashing membrane. Apply the reinforcing sheet to incorporate minimum 3 inch laps, extending the sheets a minimum of 3 inches onto the base ply surface and to the top of the parapet wall, curb, etc. Nail the reinforcing sheet on 12 inch centers in all directions to the vertical wood surface from the top of the cant to top of wall, curb, etc. Fully adhere the remainder of sheet that extends over the cant and roof level. Terminate the finish ply at the top of the cant. Cut the flashing membrane into lengths that can be easily handled. Apply a uniform coat of specified flashing cement to the area to receive flashing coverage. Set the flashing in place while exerting pressure on the flashing sheet to ensure complete contact with the wall/roof surfaces and to prevent air pockets. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers.

I. Catalyzed Acrylic Resin Flashing System: Install the liquid-applied primer and flashing system in accordance with the membrane system manufacturer’s printed installer’s guidelines and other applicable written recommendations as provided by the manufacturer.

J. Water Cut-Off: At end of day's work, or when precipitation is imminent, construct a water cut-off at all open edges. Cut-offs can be built using asphalt or plastic cement and roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.

K. Sealant: Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.

3.04 ROOF SYSTEM INTERFACE WITH RELATED COMPONENTS

A. Edge Metal: Completely prime metal flanges and allow to dry prior to installation. Turn the base ply down 2 inches past the roof edge and over the nailer. After the base ply and continuous cleat (if applicable) have been installed, set the flange in mastic and stagger nail every 3 inches on center. Strip-in the flange using the stripping-ply material and the specified adhesive, extending a minimum of 4 inches beyond the edge of the flange. Terminate the finish ply at the gravel-stop rise of the edge metal. SEE ITEM: SEALANT, for finish of this detail.

B. Walktread: Cut the walktread into maximum 5 foot lengths and allow to relax until flat. Adhere the sheet using the specified plastic cement. Apply the specified cement in a 3/8 inch thickness to the back of the product in 5 inch by 5 inch spots in accordance with the pattern as supplied by the walktread manufacturer. Walk-in each sheet after application to ensure proper adhesion. Use a minimum spacing of 2 inches between sheets to allow for proper drainage.

C. Sealant: Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.

3.05 FIELD QUALITY CONTROL AND INSPECTIONS

A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.

B. Notification of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Final Inspection/Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

D. Issuance of the Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.