SECTION 075552 - MODIFIED BITUMEN MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Preparation of Substrate to Receive Roofing Materials

B. Base Sheet and Roof Insulation Application to Prepared Substrate

C. Roof Membrane Application

D. Roof Flashing Application

E. Incorporation of Sheet Metal Flashing Components and Roofing Accessories into the Roof System

F. NOTE THE FOLLOWING:

- Included in the Bid, the roofing manufacturer (see Spec Sections 075552 and 077100) shall furnish, for installation by the Contractor/Roofer, products to complete the work as applicable or called for, such as prefabricated perimeter metal systems, Parapro Roof Membrane and Parapro 123 Flashing systems, or other products that when used with the approved manufacturer's systems, shall be covered under a manufacturer's specified guarantee.

- The above items shall be guaranteed by the roofing manufacturer, and shall be installed to manufacturer standards/recommendations (see Spec Section 077100). The roofing manufacturer's guarantee does not cover separately fabricated (either field fabricated or shop fabricated) metal systems that interface into the membrane products.

- Gutters and downspouts shall be provided as called for on the drawings and/or as specified in Spec Section (076200). Gutters and downspouts are not available from the roofing manufacturer, and are not guaranteed by the roofing manufacturer.

- The roofing manufacturer can supply flat sheets of metal with exact color matched finishes to the built in systems. However, this source of flat material is optional for gutters, downspouts, and metal that is not integrated with the roofing materials.

1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

A. Sheet Metal Flashing and Trim

B. Sheet Metal Roofing Specialties

1.03 RELATED SECTIONS

A. Section 076200 - Sheet Metal Flashing and Trim

B. Section 077100 – Prefabricated Fascias Copings and Expansion Joints

1.04 REFERENCE STANDARDS

References in these specifications to standards, test methods and codes, 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 these specifications.

ASTM American Society for Testing and Materials
Philadelphia, PA

FM Factory Mutual Engineering and Research
Norwood, MA

NRCA National Roofing Contractors Association
Rosemont, IL

OSHA Occupational Safety and Health Administration
Washington, DC

SMACNA Sheet Metal and Air Conditioning Contractors National Association
Chantilly, VA

UL Underwriters Laboratories
Northbrook, IL

1.05 DESCRIPTION OF WORK

The basic work descriptions required in this specification are referenced below. This design is based on products by Siplast, however subject to compliance with requirements, equal products or systems are acceptable with prior approval; written requests may be submitted in accordance with “Instructions to Bidders” paragraph 3.3. Disconnection and removal, re-installation and re-connection of all equipment will be by St. Tammany Parish School Board.

Building A
Type 1

Project Type: Tear-off Specification #: 2030 IT

Deck: Cementious wood fiber Slope: Less than 1/8 inch

Base Sheet: Parabase FS, mechanically attached, using ParaLok Fasteners.

Insulation – bottom layer: Paratherm System by Siplast, having a thickness of 2 inches, applied in Parafast Insulation Adhesive.

Insulation – tapered layer: Tapered Paratherm Crickets by Siplast, providing for a roof slope of 1/4 inch, applied in Parafast Insulation Adhesive.

Insulation - top layer: Dens Deck Prime by Georgia-Pacific, having a thickness of 1/2 inch, applied in Parafast Insulation Adhesive.

Roof System: Paradiene 20 TG, torch applied;

Paradiene 30 FR TG, torch applied

Flashing System: Paradiene 20, cement applied;

Veral Aluminum, torch applied.

Building A
Type 2

Project Type: Tear-off Specification #: 2030 IT

Deck: Existing lightweight concrete Slope: minimum 1/8 inch

Base Sheet: Parabase FS, mechanically fastened, using Zono-tite Fasteners.

Insulation – bottom layer: Paratherm System by Siplast, having a thickness of 2 inches, applied in Parafast Insulation Adhesive.

Insulation - top layer: Dens Deck Prime by Georgia-Pacific, having a thickness of 1/2 inch, applied in Parafast Insulation Adhesive.

Roof System: Paradiene 20 TG, torch applied;

Paradiene 30 FR TG, torch applied

Flashing System: Paradiene 20, cement applied;

Veral Aluminum, torch applied.

Building B

Project Type: Tear-off Specification #: 2030 IT

Deck: Existing lightweight concrete Slope: 1 inch

Base Sheet: Parabase FS, mechanically fastened, using Zono-tite Fasteners.

Insulation – bottom layer: Paratherm System by Siplast, having a thickness of 2 inches, applied in Parafast Insulation Adhesive.

Insulation - top layer: Dens Deck Prime by Georgia-Pacific, having a thickness of 1/2 inch, applied in Parafast Insulation Adhesive.

Roof System: Paradiene 20 TG, torch applied;

Paradiene 30 FR TG, torch applied

Flashing System: Paradiene 20, cement applied;

Veral Aluminum, torch applied.

1.06 SUBMITTALS

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

A. Submittal of Equals: Submit primary roof systems to be considered as equals to the specified roof system no less than ten (10) days prior to bid date, as per “Instructions to Bidders” paragraph 3.3. Should there be any conflict between the requirements listed below and those in the “Instructions to Bidders” the requirements in the “Instructions to Bidders” takes precedence. Primary roof systems which have been reviewed and accepted as equals to the specified roof system will be listed in an addendum prior to bid date; only then will equals be accepted at bidding. Submittals shall include the following:

1. Two 3 inch x 5 inch samples of the primary roofing and flashing sheets.

2. Latest edition of the roofing system manufacturer's specifications and installation instructions.

3. Evidence that the manufacturer of the proposed roofing system utilizes a quality management system that is ISO 9001:2000 certified. Documentation of ISO 9001:2000 certification of foreign subsidiaries without domestic certification will not be accepted.

4. Evidence and description of manufacturer's quality control/quality assurance program for the primary roofing products supplied. The quality assurance program description shall include all methods of testing for physical and mechanical property values. Provide confirmation of manufacturer's certificate of analysis for reporting the tested values of the actual material being supplied for the project prior to issuance of the specified guarantee.

5. Descriptive list of the materials proposed for use.

6. Evidence of Underwriters' Laboratories Class A acceptance of the proposed roofing system without additional requirements for gravel or coatings. No other testing agency approvals will be accepted.

7. (Tectum Deck Assembly) The installation of the roof assembly (including fastening of base sheet or insulation) shall follow a tested application method by FM Global for minimum 1-90 windstorm construction.

8. (Lighweight Deck – Assembly) Miami – Dade Notice of Acceptance (NOA) listing for the proposed system. The roof membrane configuration is based on a maximum design pressure of - 45 psf subject to General Limitation #9.

    a) The roof membrane configuration shall be approved by FM for Class 1-SH (severe hail) exposure.

9. Letter from the proposed primary roofing manufacturer confirming that a phased roof application, with only the modified bitumen base ply in place for a period of up to 10 weeks, is acceptable and approved for this project.

10. List of 3 of the proposed primary roofing manufacturer's projects, located in the United States, of equal size and degree of difficulty which have been performing successfully for a period of at least 10 years.

11. Request for substitution constitutes a representation that the Contractor:

    a. Has personally investigated the proposed substitute product and determined that it is equal to or superior in all respect to that specified.
    b. Will provide the same or better warranties, bonds and guarantees for the substitution as for the specified product.
    c. Will coordinate the installation of an accepted substitution into the Work and making such changes as may be required to make the Work complete in all repects.
    d. Waives all claims for additional costs, related to the substitution which may subsequently become apparent.
    e. Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect’s redesigns costs, and waives all claims for additional costs related to the substitution which subsequently become apparent.

12. Should the Contractor propose a substitute material or method assembly that is of questionable quality or suitability to the Architect, suitable tests may be required to establish a basis for acceptance or rejection. Such tests will be paid for by the Contractor and conducted in accordance with industry accepted standards and as accepted to the Architect.

13. Substitutions will not be considered when they are indicated or implied in shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

14. The Architect shall be the judge of the acceptablility of proposed substitutions.

15. The Owner reserves the right to disapprove and reject any request for substitution.

16. Letter from the proposed primary roofing manufacturer confirming that the filler content in the elastomeric blend of the proposed roof membrane and flashing components does not exceed 35% in weight.

17. Complete list of material physical and mechanical properties for each sheet including: weights and thicknesses; low temperature flexibility; peak load; ultimate elongation; dimensional stability; compound stability; high temperature stability; granule embedment and resistance to thermal shock for foil faced products.

18. Sample copy of the proposed guarantee.

B. 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.

C. Submittals Prior to Project Close-out:

1. Certificate Of Analysis from the testing laboratory of the primary roofing materials manufacturer, confirming the physical and mechanical properties of the roofing membrane components. Testing shall be in accordance with the parameters published in ASTM D 5147 and ASTM D 6298 and indicate Quality Assurance/Quality Control data as required to meet the specified properties. A separate Certificate Of Analysis for each production run of material shall indicate the following information:

   a) Material type
   b) Lot number
   c) Production date
   d) Dimensions and Mass (indicate the lowest values recorded during the production run);
      - Roll length
      - Roll width
      - Selvage width
      - Total thickness
      - Thickness at selvage (coating thickness)
      - Weight
   e) Physical and Mechanical Properties;
      - Low temperature flexibility
      - Peak load
      - Ultimate Elongation @ 5% Maximum Load
      - Dimensional stability
      - Compound Stability
      - Granule embedment
      - Resistance to thermal shock (foil faced products)

2. Manufacturer's printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.

1.07 QUALITY ASSURANCE

A. Acceptable Products: Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years.

B. Product Quality Assurance Program: Primary roofing materials shall be manufactured under a quality management system that is monitored regularly by a third party auditor under the ISO 9001:2000 audit process. A certificate of analysis for reporting/confirming the tested values of the actual material being supplied for the project will be required prior to project close-out.

C. At Owner's option the Contractor shall have the roofing materials for the project delivered to the area of the project (i.e. distribution warehouse, job site, or other location where materials can be stored properly and securely) (within 75 mile radius) and be identified and held specifically for this project. Roofing contractor at owner request and direction shall provide samples from the pallets of roofing materials indicated to be designated for this project as needed for independent lab testing for quality of roofing per ASTM standards as requested by the owner. Cost of testing shall be paid by the owner. If any materials tested are found to not meet ASTM standards indicated by the project specifications and data sheets of the material, the materials will not be accepted for the project and will be replaced by the contractor. Any replacement materials shall be paid by the Contractor. Contractor should allow a minimum of 10-12 weeks for testing of roofing products prior to the need to place roofing on structure. While testing is being done, the owner will not pay for any roofing materials stored on/off site.

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

   1. Underwriters Laboratories Class A acceptance of the proposed roofing system (including mopping asphalt or cold adhesive) without additional requirements for gravel or coatings.

   2. (Tectum Deck Assembly) The installation of the roof assembly (including fastening of base sheet or insulation) shall follow a tested application method by FM Global for minimum 1-90 windstorm construction.

   3. (Lighweight Deck – Assembly) Miami – Dade Notice of Acceptance (NOA) listing for the proposed system. The roof membrane configuration is based on a maximum design pressure of - 45 psf subject to General Limitation #9.

E. Accessory Products: Accessory products shall be supplied by the primary roof system manufacturer for coverage under the terms of the guarantee. The primary membrane manufacture shall have private labeling agreements with secondary and accessory product suppliers for the listed products; thermal insulation, cover panel, insulation fasteners, fastener plates, cements, primers, sealants, membrane and insulation adhesives, perimeter metal systems, etc. Manufacturer shall provide evidence that it complies with these requirements by providing

1. Primary manufacturer’s commercial product data sheets.

2. If a primary roof system manufacturer has an expressed endorsement for primary and secondary roof system products. A letter will be required from the primary roofing system manufacturer detailing any expressed endorsements with accessory product suppliers and evidence of how the product is to be covered under the guarantee

F. Acceptable Contractor: Contractor shall have a minimum of 2 years experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products.

G. 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.

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

I. Manufacturer Requirements: Ensure that the primary roofing materials manufacturer provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.

1.09 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. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.

3. 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 material, applied roofing, and building interiors are protected from possible moisture damage or contamination.

C. Protection Requirements

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

2. Torch Safety: Crew members handling torches shall be trained by an Authorized Certified Roofing Torch Applicator (CERTA) Trainer, be certified according to CERTA torch safety guidelines as published by the National Roofing Contractor's Association (NRCA), and follow torch safety practices as required by the contractor's insurance carrier. Designate one person on each crew to perform a daily fire watch. The designated crew member shall watch for fires or smoldering materials on all areas during roof construction activity, and for the minimum period required by CERTA guidelines after roofing material application has been suspended for the day.

3. Limited Access: Prevent access by the public to materials, tools and equipment during the course of the project.

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

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

1.10 GUARANTEE/WARRANTY

A. 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 twenty (20) year labor and materials guarantee covering the rigid insulation, insulation adhesive, base sheet fasteners, roof membrane/flashing system and the perimeter sheet metal system, as specified in Section 077100 Roof Specialties, by Inclusion Addendum. The guarantee shall be a term type, without deductibles or limitations on coverage amount (N.D.L., No Dollar Limit), and shall be issued at no additional cost to the Owner.

1. Siplast 20 year Roof Membrane/System Guarantee with Paraguard Perimeter Metal Inclusion Addenda or other pre-approved manufacture system.
2. Stipulations inconsistent with the warranty requirements, or change of venue, will not be accepted.
3. Owner will not co-sign the warranty.
4. Contractor shall provide 2 year weather-tight warranty for all materials/installations.
5. Complete system warranty for all roof penetrations shall be provided.

PART 2 PRODUCTS

2.01 ROOFING SYSTEM ASSEMBLY/PRODUCTS

A. Base Sheet

1. Base Sheet: A fiberglass reinforced, asphalt coated sheet with a polyolefin film backing, having a minimum weight of 20 lb/sq. The sheet shall conform to ASTM D 4601, Type II requirements.

> Siplast Parabase FS or other pre-approved manufacture's base sheet.

B. Rigid 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.

1. Polyisocyanurate: A closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2. Panels shall have a nominal thickness of 2 inches. Acceptable types are as follows:

> Paratherm by Siplast; Irving, TX or other pre-approved manufacture's rigid roof insulation.

2. Polyisocyanurate Tapered Roof Insulation: Tapered panels and standard fill panels composed of a closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber reinforced organic facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2 (20 psi). The tapered system shall provide for a roof slope of 1/4 inch per foot. Acceptable types are as follows.

> Tapered Paratherm by Siplast; Irving, TX or other pre-approved manufacture's rigid roof insulation.

3. Tapered crickets: A closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2. Panels shall provide for positive slope to facilitate drainage. Acceptable types are as follows:

> Paratherm by Siplast; Irving, TX or other pre-approved manufacture's rigid roof insulation.

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 1/2 inch. The panel surface shall be factory primed with a non-asphaltic primer. Acceptable types are as follows:

> Dens Deck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA or other pre-approved manufacture's gypsum sheathing panel.

5. Perlite Tapered Edge Panels: A tapered panel composed of 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

A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous 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 and coated one side with a torch grade SBS bitumen blend adhesive layer. The adhesive layer shall be manufactured using a process that embosses the surface with a grooved pattern to provide optimum burn-off of the plastic film and to maximize application rates. The cross sectional area of the sheet material shall contain no oxidized or non-SBS modified bitumen. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F (-10°C). Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147. 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 Paradiene 20 TG/30 FR TG torchable roof system or other pre-approved manufacture's roofing membrane assembly.

1. Modified Bitumen Base and Stripping Ply

   a) Thickness (avg): 114 mils (2.9 mm) (ASTM D 5147)
   b) Thickness (min): 110 mils (2.8 mm) (ASTM D 5147)
   c) Weight (min per 100 ft² of coverage): 76 lb (3.7 kg/m²)
   d) Maximum filler content in elastomeric blend: 35% by weight
   e) Low temperature flexibility @ -15□F (-26□C): PASS (ASTM D 5147)
   f) Peak Load (avg) @ 73□F (23□C): 30 lbf/inch (5.3 kN/m) (ASTM D 5147)
   g) Peak Load (avg) @ 0□F (-18□C): 75 lbf/inch (13.2 kN/m) (ASTM D 5147)
   h) Ultimate Elongation (avg.) @ 73□F (23□C): 50% (ASTM D 5147)
   i) Dimensional Stability (max): 0.1% (ASTM D 5147)
   j) Compound Stability (min): 250□F (121□C) (ASTM D 5147)
   k) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
   l) Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria

      > Siplast Paradiene 20 - torchable grade or other pre-approved manufacture's Modified Bitumen Base and Stripping Ply.

2. Modified Bitumen Stripping Ply at Gravel Stop

   a) Thickness (avg): 138 mils (3.5 mm) (ASTM D 5147)
   b) Thickness (min): 134 mils (3.4 mm) (ASTM D 5147)
   c) Weight (min per 100 ft² of coverage): 96 lb (4.7 kg/m²)

d) Peak filler content in elastomeric blend - 35% by weight
e) Low temperature flexibility @ -13□F (-25□C): PASS (ASTM D 5147)
f) Peak Load (avg) @ 73 □F (23□C): 80 lbf/inch (14.1 kN/m) (ASTM D 5147)
g) Peak Load (avg) @ 0 □F (-18□C): 150 lbf/inch (26.5 kN/m) (ASTM D 5147)
h) Ultimate Elongation (avg.) @ 73 □F (23□C): 100% (ASTM D 5147)
i) Compound Stability (max): 0.1% (ASTM D 5147)
j) High Temperature Stability (min): 250 □F (121□C) (ASTM D 5147)
k) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
l) Reinforcement: fiberglass mat or other meeting the performance and Compound stability criteria

> Siplast Paradiene 20EG TG, torch grade or other pre-approved manufacture's Modified Bitumen Stripping Ply at Gravel Stop.

3. Modified Bitumen Finish Ply

a) Thickness (avg): 138 mils (3.5 mm) (ASTM D 5147)
b) Thickness at selvage (coating thickness) (avg): 118 mils (3.0 mm) (ASTM D 5147)
c) Thickness at selvage (coating thickness) (min): 114 mils (2.9 mm) (ASTM D 5147)
d) Weight (min per 100 ft² of coverage): 112 lb (5.4 kg/m²)
e) Maximum filler content in elastomeric blend: 35% by weight
f) Low temperature flexibility @ -15□F (-26□C): PASS (ASTM D 5147)
g) Peak Load (avg) @ 73 □F (23□C): 30 lbf/inch (5.3 kN/m) (ASTM D 5147)
h) Peak Load (avg) @ 0 □F (-18□C): 75 lbf/inch (13.2 kN/m) (ASTM D 5147)
i) Ultimate Elongation (avg.) @ 73 □F (23□C): 55% (ASTM D 5147)
j) Dimensional Stability (max): 0.1% (ASTM D 5147)
k) Compound Stability (min): 250 □F (121□ C) (ASTM D 5147)
l) Granule Embedment (max loss): 2.0 grams per sample (ASTM D 5147)
m) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
n) Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria
o) Surfacing: ceramic granules

> Siplast Paradiene 30 FR - torchable grade or other pre-approved manufacture's Modified Bitumen Finish Ply.

B. Flashing Membrane Assembly: A flashing membrane assembly consisting of a prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements.

> Siplast Veral flashing system, aluminum finish or other pre-approved manufacture's Flashing Membrane Assembly.

1. Cant Backing Sheet and Flashing Reinforcing Ply

a) Thickness (avg): 91 mils (2.3 mm) (ASTM D 5147)
b) Maximum filler content in elastomeric blend: 35% by weight

c) Ultimate Elongation (avg.) @ 73ºF (23ºC): 50% (ASTM D 5147)
d) Dimensional Stability (max): 0.1% (ASTM D 5147)
e) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
f) Reinforcement: fiberglass mat meeting the performance and dimensional stability criteria
g) Back Surfacing: sanded

> Siplast Paradiene 20, set in SFT Cement or other pre-approved manufacture's Cant Backing Sheet and Flashing Reinforcing Ply.

2. Metal-Clad Modified Bitumen Flashing Sheet

a) Thickness (avg): 142 mils (3.6 mm) (ASTM D 5147)
b) Thickness (min): 138 mils (3.5 mm) (ASTM D 5147)
c) Weight (min per 100 ft² of coverage): 92 lb (4.5 kg/m²)
d) Coating Thickness – back surface (min): 40 mils (1 mm) (ASTM D 5147)
e) Low temperature flexibility @ 0º F (-18º C): PASS (ASTM D 5147)
f) Peak Load (avg) @ 73ºF (23ºC): 85 lbf/inch (15 kN/m) (ASTM D 5147)
g) Peak Load (avg) @ 0ºF (-18ºC): 180 lbf/inch (31.7 kN/m) (ASTM D 5147)
h) Ultimate Elongation (avg) @ 73ºF (23ºC): 45% (ASTM D 5147)
i) Tear-Strength (avg): 120 lbf (0.54 kN) (ASTM D 5147)
j) Dimensional Stability (max): 0.2% (ASTM D 5147)
k) Compound Stability (min): 225ºF (107ºC) (ASTM D 5147)
l) Cyclic Thermal Shock Stability (maximum): 0.2% (ASTM D 7051)
m) Approvals: UL Approved, FM Approved (products shall bear seals of approval)
n) Reinforcement: fiberglass scrim mat or other meeting the performance and dimensional stability criteria
o) Surfacing: aluminum metal foil

> Siplast Veral Aluminum or other pre-approved manufacture's Metal-Clad Modified Bitumen Flashing Sheet.

C. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic 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 resin and catalyst are pre-mixed immediately prior to installation. 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; Irving, TX or other pre-approved manufacture's Catalyzed Acrylic Resin Flashing System.

2.03 ROOFING ACCESSORIES

A. Roofing Adhesives

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

> Parafast Insulation Adhesive Fastener by Siplast or other pre-approved manufacture's Insulation Adesive.

B. Bituminous Cutback Materials

1. Primer: An asphalt, solvent blend conforming to ASTM D 41 requirements.

> Siplast PA-1125 Asphalt Primer by Siplast; Irving, TX or other pre-approved manufacture's Primer.

2. Primer: A single component, water based primer, to promote adhesion of self-adhesive membranes to masonry, wood, plywood, concrete and gypsum surfaces.

> Siplast TA-119 Primer by Siplast; Irving, TX or other pre-approved manufacture's Primer.

3. Mastics: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D 4586 Type II requirements.

> Siplast PA-1021 Plastic Cement by Siplast; Irving, TX or other pre-approved manufacture's Mastic.

C. Solvent-Free Flashing Cement: A single-component, solvent-free modified cement. The adhesive blend shall be formulated in a grade for application of flashing materials.

> Siplast SFT Cement by Siplast; Irving, TX or other pre-approved manufacture's Solvent-Free Flashing Cement.

D. Sealant: 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:

> Siplast PS-209 Elastomeric Sealant by Siplast; Irving, TX or other pre-approved manufacture's Sealant.

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

F. 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.

G. Fasteners

1. Base Sheet Fasteners: Base sheet fasteners shall be approved by the manufacturer of the primary roofing products. Acceptable base sheet fasteners for specific substrate types are listed below.

a) Wood Cement Fiber Decks

- A single unit, precision formed, Galvalume (AZ-55) coated steel fastener having a 2.7 inch cap and a 1.8 inch long shank. The fastener shall incorporate twin high tensile steel wires that facilitate a diverging reverse hook action when driven into the structural substrate.

2. Lightweight Concrete Substrates

- A single unit, precision formed, electro zinc coated steel fastener having a 2.7 inch diameter rib reinforced cap and 1.7 inch long rectangular legs, designed to expand when fully driven into the lightweight concrete. Fasteners for lightweight concrete shall meet FM Standard 4470 requirements for corrosion resistance.

> Zono-tite Base Sheet Fasteners by Siplast / Icopal; Irving, TX or other pre-approved manufacture's Lightweight Concrete Substrate.

3. 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.

> Square Cap by W.H. Maze Co.; Peru, IL
> 12 Gauge Simplex Nail by the Simplex Nail and Manufacturing Co., Americus, GA
> Or other pre-approved manufacture's roofing fastener.

H. 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: 1.8 lb/ft² (8.8 kg/m²)
3. Width: 30 in (76.2 cm)

> Paratread Roof Protection Material by Siplast; Irving, TX or other pre-approved manufacture's Walktread.

PART 3 EXECUTION

3.01 PREPARATION

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

B. Remove All Existing:

- Surface gravel
- Roof membrane
- Insulation
- Base flashings
- Edge metal
- Flanged metal flashings
- Cants
- Walkways
- Non functional penetrations/curbs
- Vapor retarder
- Metal trim, counterflashing

3.02 SUBSTRATE PREPARATION

A. Base Sheet Securement to tectum substrate: Lay the base sheet over the entire area to be roofed, lapping sides 3 inches and ends 6 inches. Using the specified fasteners, fasten each sheet every 9 inches through laps and stagger fasten the remainder of the sheet in 2 rows on nominal 18 inch centers with fasteners in each row on 9 inch centers. Increase the fastening pattern by 70% at the perimeter and 160% in the corners.

B. Base Sheet Securement to lightweight concrete substrate: Lay the base sheet over the entire area to be roofed, lapping sides 3 inches and ends 6 inches. Using the specified fasteners, fasten each sheet every 7-1/2 inches through laps and stagger fasten the remainder of the sheet in 2 rows on nominal 7 inch centers with fasteners in each row on 10 inch centers. Increase the fastening frequency at the perimeter of the roof by 70% and at the corners of the roof by 160%.

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 the 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 applied in insulation adhesive.

1. Insulation - multiple layer: Install all layers in an application of the specified insulation adhesive in strict accordance with the requirements of the insulation adhesive supplier. Stagger the panel joints between insulation layers.

2. Insulation - double layer: Install both layers in an application of the specified insulation adhesive in strict accordance with the requirements of the insulation adhesive supplier. Stagger the panel joints between insulation layers. Using specified adhesive fastener, apply adhesive in a minimum ¾-inch wide bead in a serpetene pattern at a rate of 12” inches on center in the field of the roof. Decrease the adhesive bead spacing by 40% (7-inches on center) along the perimeter and by 60% (4-inches on center) at the corners of the roof.

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

4. 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

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 base sheet and/or insulation as a continuous operation.

B. Aesthetic Considerations: 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. Priming: Prime metal and concrete and masonry surfaces with a uniform coating of the specified asphalt primer.

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.

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

2. Fully bond the base ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. 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.

3. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Stagger end laps of the finish ply a minimum 3 feet. 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 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. Flashing Application – wood/plywood surfaces: Flash wood/plywood parapet walls and curbs using the reinforcing sheet and the metal foil flashing membrane. The reinforcing sheet shall have minimum 3 inch side laps and extend a minimum of 3 inches onto the base ply surface and to the top of the parapet wall or curb. Apply a uniform coat of the specified flashing cement to the back of the reinforcing sheet as well as the area to receive flashing coverage, including the exposed selvage edge of the adjacent flashing sheet. Set the reinforcing sheet in place and exert pressure on the sheet during application to ensure complete contact with the wall/roof surfaces, preventing air pockets. Nail the reinforcing sheet through the field of the sheet to the vertical wood surface on 12 inch centers from the top of the cant to top of the wall or curb. Fully adhere the remainder of the flashing reinforcing sheet that extends over the cant and roof level. Install the finish ply to extend to the top of the cant. Cut the flashing material into the desired lengths off the end of roll in three foot widths. . . Stagger the laps of the flashing sheet layer from the lap seams in the reinforcing ply. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. (See manufacturer's schematic for visual interpretation).

H. 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.

I. 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.

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, 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. Lead Pipe Flashings: Completely prime the lead flanges and allow to dry prior to installation. After the base ply has been applied, set the flange in mastic and strip-in the flange using the stripping-ply material, extending a minimum of 4 inches beyond the edge of the flange. Terminate the finish ply at the flange-sleeve juncture of the pipe flashing. SEE ITEM: SEALANT for finish of this detail.

C. Lead Drain Flashings: Completely prime the lead drain flashing and allow to dry prior to installation. After the base ply has been applied, set the lead flashing sheet in mastic

and form to turn down inside of the drain bowl. Ply-in the perimeter of the lead flashing using an additional layer of the base ply material, overlapping the perimeter of the lead a minimum of 4 inches. Terminate the finish ply to extend beneath the clamping ring seal. Install the clamping ring with all bolts in place.

D. Light Air Unit Supports: Separate light air handling units that are supported by wood sleepers (not supported by a roof curb) from the new roof assembly using the manufacturer's walktread-roof protection material. Cut each walktread pad to a size which extends a minimum of 2 inches beyond the perimeter of each sleeper block. Set the walktread pad dry over the new assembly. Set each sleeper block dry over the walktread pad.

E. Small Pipe Supports: Support all gas lines and conduits which are a maximum of 1 inch diameter and run horizontally over the roof membrane surface using wood blocking and the manufacturer's walktread - roof protection material. The blocking shall be 4 inches by 4 inches by 12 inches in size. Cut each walktread pad to a size which extends a minimum of 2 inches beyond the perimeter of the blocking. Loosely secure the pipe to allow movement over the 6 inch center of each block; the spacing for the blocks shall be of adequate distance to prevent sagging of the pipe and to prevent the pipe from coming into contact with the new roof assembly. Set the walktread dry over the new roof assembly. Set each pipe support block dry over the walktread pad.

F. Metal Pipe Flashings: Completely prime the metal pipe flanges and allow to dry prior to installation. After the base ply has been applied, set the flanges in mastic and strip-in the flange using the stripping-ply material, extending a minimum of 4 inches beyond the edge of the flange. Terminate the finish ply at the flange-sleeve juncture of the pipe flashing. Install a watertight umbrella to the penetration, completely covering the opening of the pipe flashing. SEE ITEM: SEALANT for finish of this detail.

G. 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.

H. 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

1. 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.

END OF SECTION 075552