SECTION 07 22 00

ROOF INSULATION

NOTE: This guide specification is provided as a guideline and must be modified, as required, by the Designer of Record for each project. This specification is prepared in general accordance with CSI format to be included under Division 7 – Thermal and Moisture Protection. Additional information is provided. [delete this paragraph]

Optional information is presented in “blue” font below. Choose appropriate options, delete, as necessary. [delete this paragraph]

# GENERAL

## SUMMARY

### Work shall include, but is not limited to, the following:

#### Preparation of [existing][new] roof deck and all flashing substrates.

#### Thermal Barrier

#### Insulation

#### Cover-board

#### SBS Modified Bitumen Laminated Cover-board

#### All related materials and labor required to complete specified roofing necessary to receive specified manufacturer’s warranty.

## RELATED SECTIONS

### Division 010000 – General Requirements

### Division 011000 – Summary of Work

### Division 071416 – Cold Fluid-Applied Waterproofing

### Division 072713 – Modified Bituminous Sheet Vapor Retarders

### Division 075216 – Styrene-Butadiene-Styrene (SBS) Modified Bitumen Membrane Roofing

### Division 075419 – Polyvinyl-Chloride (PVC) Roofing

### Division 076200 – Sheet Metal Flashing and Trim

## DEFINITIONS

### ASTM D 1079-Definitions of Term Relating to Roofing and Waterproofing.

### The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual, Fifth Edition Glossary.

## REFERENCES

### AMERICAN SOCIETY OF CIVIL ENGINEERS - Reference Document ASCE 7, Minimum Design Loads for Buildings and Other Structures.

### AMERICAN STANDARD OF TESTING METHODS (ASTM):

#### ASTM C 726 - Standard Specification for Mineral Wool Roof Insulation Board.

#### ASTM C 728 - Standard Specification for Perlite Thermal Insulation Board.

#### ASTM C 1177/C 1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

#### ASTM C 1278 - Standard Specification for Fiber-Reinforced Gypsum Panel.

#### ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Insulation Board.

#### ASTM C 1325 – Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.

#### ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.

### AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)::

#### ANSI/SPRI FX-1, Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.

#### ANSI/SPRI IA-1, Standard Field Test Procedure for Determining the Mechanical Uplift Resistance of Insulation Adhesives over Various Substrates.

#### ANSI/FM 4474- American National Standard for Evaluating the Simulated Wind Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures.

### CANADIAN GENERAL STANDARDS BOARD (CGSB):

#### CGSB 37-GP 56M- Standard for: Modified Bituminous, Prefabricated, and Reinforced for Roofing.

### FACTORY MUTUAL (FM):

#### FM 4450 - Approval Standard - Class I Insulated Steel Roof Decks.

#### FM 4470 - Approval Standard - Class I Roof Covers.

### FLORIDA BUILDING CODE (FBC):

#### 20XX Florida Building Code (FBC).

### INTERNATIONAL CODES COUNCIL (ICC):

#### 20XX International Building Code (IBC).

### NATIONAL ROOFING CONTRACTORS’ ASSOCIATION (NRCA).

### UNDERWRITERS LABORATORY (UL):

#### UL 790 Standard Test Methods for Fire Tests of Roof Coverings.

#### UL 1256 – Fire Test of Roof Deck Constructions.

## ACTION SUBMITTALS

### Product Data Sheets: Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.

### Safety Data Sheets: Submit manufacturer’s Safety Data Sheets (SDS) for each component.

### Sample/Specimen Warranty from the manufacturer and contractor.

### Shop Drawings: Provide roof plan and applicable roof system detail drawings.

## INFORMATIONAL SUBMITTALS

### Contractor Certification: Submit written certification from roofing system manufacturer certifying that the applicator is authorized by the manufacturer to install the specified materials and system.

## CLOSEOUT SUBMITTALS

### Warranty: Provide manufacturers and contractor’s warranties upon substantial completion of the roofing system.

## QUALITY ASSURANCE

### MANUFACTURER QUALIFICATIONS:

#### Manufacture shall have 20 years of experience manufacturing roofing materials.

#### Trained Technical Field Representatives, employed by the manufacturer, independent of sales.

#### Provide reports in a timely manner of all site visit reports.

#### Provide specified warranty upon satisfactory project completion.

### CONTRACTOR QUALIFICATIONS:

#### Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.

#### Applicators shall have completed projects of similar scope using same materials as specified herein.

#### Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roof system through satisfactory project completion.

#### Applicators shall be skilled in the application methods for all materials.

#### Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.

#### Contractor shall maintain a copy of all submittal documents, on-site, available always for reference.

## DELIVERY, STORAGE AND HANDLING

### Refer to each product data sheet or other published literature for specific requirements.

### Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.

### Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location.

### When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.

### Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

## SITE CONDITIONS

### SAFETY:

#### The contractor shall be responsible for complying with all project-related safety and environmental requirements.

#### Refer to NRCA CERTA recommendations, local codes and building owner’s requirements for hot work operations.

#### The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid-applied, or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.

#### The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified hot asphalt-applied materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions, or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.

#### The contractor shall refer to product Safety Data Sheets (SDS) for health, safety, and environment related hazards, and take all necessary measures and precautions to comply with exposure requirements.

### ENVIRONMENTAL CONDITIONS:

#### Monitor substrate temperature and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.

#### Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.

#### Mopping asphalt application: Primer, where used, shall be fully dry before applying hot asphalt. Take all necessary measures and monitor all conditions, to ensure the specified asphalt temperature is no less than 400°F (204°C) at the point of contact with the specified membrane as it is rolled into the hot asphalt.

## PERFORMANCE REQUIREMENTS

### FIRE CLASSIFICATION:

#### Roof construction performance testing shall be in accordance with UL 1256, FM 4450, or FM 4470 to meet the specified requirements for interior flame spread and fuel contribution.

##### Roof construction meets requirements of UL 1256, or FM Class 1.

### ROOF SLOPE:

#### Finished roof slope shall be [¼]-inch per foot ([0] percent) minimum for roof drainage.

### ENERGY CONSERVATION REQUIREMENTS:

#### Polyisocyanurate Insulation "R" Value: Long-term thermal resistance (LTTR) values of the specified foam insulation shall be determined in accordance with CAN/ULC-S770.

#### Polyisocyanurate Insulation "R" Value: Shall be determined in accordance with ASTM C1289-11a.

#### Thermal Resistance ‘R’ for the specified roof insulation system shall include the continuous insulation (ci) above the roof deck.

##### Total Thermal Resistance R Value, continuous insulation (ci) above-deck: R-[00].

# PRODUCTS

## MANUFACTURER

### SINGLE SOURCE MANUFACTURER: All roofing materials shall be provided by a single supplier with 20 years or more manufacturing history in the US.

#### Comply with the Manufacturer’s requirements as necessary to provide the specified warranty.

### PRODUCT QUALITY ASSURANCE PROGRAM: Manufacturer shall be an ISO 9001 registered company.

### ACCEPTABLE MANUFACTURER:

#### SOPREMA, located at: 310 Quadral Dr.; Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.

#### Acceptable Alternate Manufacturers: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## ROOFING SYSTEM

### ROOFING SYSTEM BASIS OF DESIGN: SOPREMA

## THERMAL INSULATION SYSTEM

### THERMAL BARRIER

#### GYPSUM ROOF BOARD

##### National Gypsum Company, [DEXcell Glass Mat Roof Board][DEXcell FA Glass Mat Roof Board]:

###### Gypsum core, glass fiber-faced, roof board:

###### Thickness: [5/8 in][1/2 in]

###### Dimensions: [4 x 4 foot][4 x 8 foot] boards

###### Facer: Glass fiber.

###### Meets or exceeds ASTM C1177/C1177M.

##### Georgia Pacific Gypsum LLC, [DensDeck Roof Board][DensDeck Prime Roof Board]:

###### Gypsum core, glass fiber-faced, roof board:

###### Thickness: [1/4 in][1/2 in][5/8 in]

###### Dimensions: [4 x 4 foot][4 x 8 foot] boards

###### Facer: Glass fiber.

###### Meets or exceeds ASTM C1177/C1177M.

##### United States Gypsum, Securock Brand Gypsum-Fiber Roof Board:

###### Gypsum core, fiber-reinforced roof board.

###### Thickness: [1/4 in][1/2 in][5/8 in]

###### Dimensions: [4 x 4 foot][4 x 8 foot] boards

###### Facer: None

###### Meets or exceeds ASTM C1278.

#### CEMENT ROOF BOARD

##### National Gypsum Company, DEXcell Cement Roof Board

###### Portland cement, lightweight aggregate, and glass fiber mesh roof board.

###### Thickness: 7/16 in.

###### Dimensions: [4 x 4 foot][4 x 8 foot] boards

###### Facer: None

###### Meets or exceeds ASTM C1325.

##### United States Gypsum, Securock Brand Cement Roof Board:

###### Portland cement, lightweight aggregate, and glass fiber mesh roof board.

###### Thickness: 1/2 in.

###### Dimensions: [4 x 4 foot][4 x 8 foot] boards

###### Facer: None

###### Meets or exceeds ASTM C1325.

### RIGID INSULATION

#### POLYISOCYANURATE INSULATION:

##### SOPREMA SOPRA-ISO: Closed cell polyisocyanurate foam core bonded on each side to a glass fiber-reinforced felt facer.

###### Thickness: [0.0] in minimum board thickness. Total thickness to meet specified insulation system thermal resistance ‘R’ value

###### Dimensions: [4 x 4 foot][4 x 8 foot] boards

###### Meets or exceeds ASTM C1289, Type II, Class 1, [Grade 2 (20 psi)][Grade 3 (25 psi)].

##### SOPREMA SOPRA-ISO Tapered: Closed cell polyisocyanurate foam core bonded on each side to a glass fiber-reinforced felt facer, tapered to provide slope.

###### Taper: [1/8 in][¼ in][1/2 in] per foot. Insulation, crickets, and saddles provided with taper as required for positive roof slope.

###### Dimensions: 4 x 4 ft boards

###### Meets or exceeds ASTM C1289, Type II, Class 1, [Grade 2 (20 psi)][Grade 3 (25 psi)].

##### SOPREMA SOPRA-ISO+: Closed cell polyisocyanurate foam core bonded on each side to a coated inorganic glass-reinforced facer.

###### Thickness: [0.0] in minimum board thickness. Total thickness to meet specified insulation system thermal resistance ‘R’ value.

###### Dimensions: [4 x 4 foot][4 x 8 foot] boards

###### Meets or exceeds ASTM C1289, Type II, Class 2, [Grade 2 (20 psi)][Grade 3 (25 psi)].

###### Meets or exceeds ASTM D3273 for resistance to mold growth.

##### SOPREMA SOPRA-ISO+ Tapered: Closed cell polyisocyanurate foam core bonded on each side to a coated inorganic glass-reinforced facer, tapered to provide slope.

###### Taper: [1/8 in][¼ in][1/2 in] per foot. Insulation, crickets, and saddles provided with taper as required for positive roof slope.

###### Dimensions: 4 x 4 ft boards

###### Meets or exceeds ASTM C1289, Type II, Class 2, [Grade 2 (20 psi)][Grade 3 (25 psi)].

###### Meets or exceeds ASTM D3273 for resistance to mold growth.

#### MINERAL WOOL INSULATION:

##### SOPREMA SOPRAROCK DD: Rigid, dual-density mineral wool insulation board.

###### Dimensions: 4x4 ft

###### Thickness: 2 to 6 in maximum, in ½ in increments, flat board stock only.

###### Total thickness to meet specified insulation system thermal resistance ‘R’ value.

###### Meets or exceeds ASTM C726.

##### SOPREMA SOPRAROCK DD PLUS: Rigid, dual-density mineral wool insulation board with sanded bitumen surfacing.

###### Dimensions: 4x4 ft

###### Thickness: 2 to 6 in maximum, in ½ in increments, flat board stock only.

###### Total thickness to meet specified insulation system thermal resistance ‘R’ value.

###### Meets or exceeds ASTM C726.

### COVER-BOARD

#### ASPHALTIC ROOF BOARD

##### 1/8 IN SOPREMA SOPRABOARD: Mineral fortified, asphaltic roof substrate board with glass fiber facers. For use as roof cover-board and for vertical flashing substrate. ASPHALTIC ROOF BOARD shall be manufactured by the membrane supplier.

###### Thickness: 1/8 in

###### Dimensions: [4 x 4 ft][4 x 5 ft][4 x 8 ft] acceptable for mechanical attachment, insulation adhesive or asphalt application.

###### Water absorption: Less than 1 percent per ASTM D994.

###### Impact resistance: Included in FM Approvals per 4450/4470 for FM Severe Hail (SH) rating.

###### Compressive strength, psi (kPa) measured at 50 percent compression, per ASTM C472:

1/8 in board: 1,610 (11,100)

###### Puncture resistance, lbf (N) per ASTM E154:

1/8 in board: 90 (400)

##### ¼ IN SOPREMA SOPRABOARD: Mineral fortified, asphaltic roof substrate board with glass fiber facers. For use as roof cover-board and for vertical flashing substrate. ASPHALTIC ROOF BOARD shall be manufactured by the membrane supplier.

###### Thickness: 1/4 in

###### Dimensions: [4 x 4 ft][4 x 5 ft][4 x 8 ft] acceptable for mechanical attachment, insulation adhesive or asphalt application.

###### Water absorption: Less than 1 percent per ASTM D994.

###### Impact resistance: Included in FM Approvals per 4450/4470 for FM Severe Hail (SH) rating.

###### Compressive strength, psi (kPa) measured at 50 percent compression, per ASTM C472:

¼ in board: 1,320 (9,100)

###### Puncture resistance, lbf (N) per ASTM E154:

¼ in board: 100 (445)

#### GYPSUM ROOF BOARD

##### National Gypsum Company, DEXcell FA Glass Mat Roof Board:

###### Gypsum core, glass fiber-faced, roof board:

###### Thickness: [5/8 in][1/2 in][1/4 in]

###### Dimensions: [4 x 4 ft][4 x 8 ft] boards

###### Facer: Glass fiber.

###### Meets or exceeds ASTM C1177/C1177M.

##### Georgia Pacific Gypsum LLC, DensDeck Prime Roof Board:

###### Gypsum core, glass fiber-faced, factory primed, roof Cover-board.

###### Thickness: [5/8 in][1/2 in][1/4 in]

###### Dimensions: [4 x 4 ft][4 x 8 ft] boards

###### Facer: Factory primed, glass fiber.

###### Meets or exceeds ASTM C1177/C1177M.

##### United States Gypsum, Securock Brand Gypsum-Fiber Roof Board:

###### Gypsum core, fiber-reinforced roof Cover-board.

###### Thickness: [5/8 in][1/2 in]

###### Dimensions: [4 x 4 ft][4 x 8 ft] boards.

###### Facer: None.

###### Meets or exceeds ASTM C1278.

#### CEMENT ROOF BOARD

##### National Gypsum Company, DEXcell Cement Roof Board

###### Portland cement, lightweight aggregate, and glass fiber mesh roof board.

###### Thickness: 7/16 in.

###### Dimensions: [4 x 4 ft][4 x 8 ft] boards

###### Facer: None

###### Meets or exceeds ASTM C1325.

##### United States Gypsum, Securock Cement Roof Board:

###### Portland cement, lightweight aggregate, and glass fiber mesh roof board.

###### Thickness: 1/2 in.

###### Dimensions: [4 x 4 ft][4 x 8 ft] boards.

###### Facer: None

###### Meets or exceeds ASTM C1325.

#### HIGH DENSITY POLYISOCYANURATE COVER-BOARD

##### SOPREMA SOPRA-ISO HD: ½ in thick, high density polyisocyanurate foam core bonded on each side to a coated inorganic glass-reinforced facer.

###### R 2.5 for ½ in thickness.

###### Dimensions: [4 x 4 ft][4 x 8 ft] boards.

###### Meets or exceeds ASTM C1289, Type II, Class 4, 100 psi.

###### Meets or exceeds ASTM D3273 for resistance to mold growth.

### SBS MODIFIED BITUMEN LAMINATED COVER-BOARD

#### 2-1 SOPRASMART BOARD

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to SOPRABOARD.

###### Dimensions: 3 x 8 ft board dimension.

###### Top Surfacing: SBS-modified bitumen membrane ply with plastic burn-off film on the top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 2-1 SOPRASMART BOARD SANDED

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to SOPRABOARD.

###### Dimensions: 3 x 8 ft board dimension.

###### Top Surfacing: SBS-modified bitumen membrane ply with sanded top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 3-1 SOPRASMART BOARD

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to SOPRABOARD top layer and [1.0 in][1.5 in][2 in][2.5 in][3 in][3.5 in][4 in] thick polyisocyanurate insulation bottom layer.

###### Dimensions: 3 x 8 ft board dimension.

###### Top Surfacing: SBS-modified bitumen membrane ply with plastic burn-off film on the top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 3-1 SOPRASMART BOARD SANDED

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to SOPRABOARD top layer and [1.0 in][1.5 in][2 in][2.5 in][3 in][3.5 in][4 in] thick polyisocyanurate insulation bottom layer.

###### Dimensions: 3 x 8 ft board dimension.

###### Top Surfacing: SBS-modified bitumen membrane ply with sanded top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 2-1 SOPRASMART ISO HD

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to 1/2 in thick high density (HD) polyisocyanurate.

###### Dimensions: [3 ft x 8 ft][3 ft x 16 ft] board

###### Top Surfacing: SBS-modified bitumen membrane ply with plastic burn-off film on the top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 2-1 SOPRASMART ISO HD SANDED

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to 1/2 in thick high density (HD) polyisocyanurate.

###### Dimensions: [3 ft x 8 ft][3 ft x 16 ft] board

###### Top Surfacing: SBS-modified bitumen membrane ply with sanded top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 2-1 SOPRASMART ROCK

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to 1.0 in or 1-1/2 in thick high density (HD) mineral wool insulation.

###### Dimensions: 3 x 16 ft board dimension

###### Top Surfacing: SBS-modified bitumen membrane ply with plastic burn-off film on the top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 2-1 SOPRASMART ROCK SANDED

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to 1.0 in or 1-1/2 in thick high density (HD) mineral wool insulation.

###### Dimensions: 3 x 16 ft board.

###### Top Surfacing: SBS-modified bitumen membrane ply with sanded top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### End-laps: Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 3-1 SOPRASMART ROCK

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to 1 in thick high density mineral wool top layer and [1.0 in][1.5 in][2 in][2.5 in][3 in][3.5 in][4 in] thick polyisocyanurate insulation bottom layer.

###### Dimensions: 3 x 8 ft board.

###### Top Surfacing: SBS-modified bitumen membrane ply with plastic burn-off film on the top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

#### 3-1 SOPRASMART ROCK SANDED

##### Non-woven polyester reinforced SBS modified bitumen membrane base ply factory laminated to 1 in thick high density mineral wool top layer and [1.0 in][1.5 in][2 in][2.5 in][3 in][3.5 in][4 in] polyisocyanurate insulation bottom layer.

###### Dimensions: 3 x 8 ft board dimension.

###### Top Surfacing: SBS-modified bitumen membrane ply with sanded top surface.

###### Side-laps: 3 in DUO-Selvage side-lap consisting of 2 in self-adhesive, and 1 in SBS-modified bitumen for heat welding.

###### Butted end-laps, with 1 in membrane overlap. Sealed watertight using SOPRALAP.

### SOPRASMART BOARD END-LAP STRIP-IN PLY

#### SOPRALAP STICK

##### Self-adhesive applied, end-lap strip-in ply for SANDED SURFACED SOPRASMART boards that have a sanded top surface. Applied with self-adhesive primer.

###### Composite glass fiber and non-woven polyester reinforced.

###### Thickness: 98.4 mil (2.5 mm)

###### Top surface: Sanded

###### Bottom Surface: SBS-modified bitumen self-adhesive membrane with release film.

###### Dimensions: 13 in x 39.6 ft (0.33 m x 12 m)

#### SOPRALAP FLAM

##### Heat welded, end-lap strip-in ply for BURN OFF FILM SURFACED SOPRASMART boards that have a plastic burn-off film on the top surface.

###### Composite glass fiber and non-woven polyester reinforced.

###### Thickness: 98.4 mil (2.5 mm)

###### Top surface: Plastic burn-off film

###### Bottom Surface: Plastic burn-off film

###### Dimensions: 13 in x 39.6 ft (0.33 m x 12 m)

#### SOPRALAP SP

##### Heat welded, end-lap strip-in ply for EITHER SANDED OR BURN OFF FILM SURFACED SOPRASMART boards that have plastic burn-off film on the bottom and a sanded surface on the top.

###### Composite glass fiber and non-woven polyester reinforced.

###### Thickness: 98.4 mil (2.5 mm)

###### Top surface: Sanded

###### Bottom Surface: Plastic burn-off film

###### Dimensions: 13 in x 39.6 ft (0.33 m x 12 m)

#### SOPRALAP SANDED

##### Adhered, end-lap strip-in ply for SANDED SURFACED SOPRASMART boards that has a sanded surface on the top and sanded surface on the bottom.

###### Composite glass fiber and non-woven polyester reinforced.

###### Thickness: 98 mil (2.5 mm)

###### Top surface: Sanded

###### Bottom Surface: Sanded

###### Dimensions: 13 in x 39.6 ft (0.33 m x 12 m)

### INSULATION CANT AND TAPERED STRIP

#### CANT STRIP, MODIFIED BITUMEN

##### SOPREMA SOPRACANT MB: Modified bitumen cant strips for use with COLPLY ADHESIVE, COLPLY FLASHING CEMENT, asphalt, and heat-welded SBS modified bitumen. Not for use with COLPLY EF nor self-adhered SBS modified bitumen.

###### Length: 39.4 in sections.

###### Cross-section dimensions: [1.25 x 1.25 x 2 in face width][2.25 x 2.25 x 3.25 in face width]. Size as required for flashing conditions.

#### CANT STRIP, RIGID MINERAL WOOL

##### SOPREMA SOPRAROCK CANT STRIPS: High density, mineral wool, bitumen coated cant strips.

###### Length: 4 ft sections.

###### Cross-section dimensions: [1.5 thick x 4 in face width][2 in thick x 5 in face width]. Size as required for flashing conditions.

###### Surface: Bitumen coated, sanded.

###### Meets or exceeds ASTM C726.

#### CANT STRIP, EXPANDED PERLITE

##### High density, laminated board made of high strength fibers and expanded perlite.

###### Length: 4 ft sections.

###### Cross Section dimensions: [1 in thick x 3 in face][1 in thick x 4 in face][1.5 in thick x 4 in face][1.5 in thick x 5 in face]. Size as required for flashing conditions.

###### Meets or exceeds ASTM C728.

#### TAPERED EDGE STRIP AND BOARDS:

##### Expanded perlite, blended with binders and fibers.

###### Dimensions: [6 in x 1/2 in][12 in x 1/2 in][1 in or 1-1/2 in][18 in x 1 in or 1-1/2 in]. Size as required.

###### Meets or exceeds ASTM C728.

### INSULATION ADHESIVE

#### POLYURETHANE FOAM INSULATION ADHESIVE

##### SOPREMA DUOTACK 365: Two-component, polyurethane foam insulation adhesive, applied in ribbons from cartridges or two-component bulk packaging with pump-driven delivery system.

###### Ribbon size: 1/2 in to 3/4 in wide.

###### Ribbon spacing: As required to meet specified wind uplift resistance performance.

Field of Roof (Zone 1’): 12 in on-centers

Field of Roof (Zone 1): 12 in on-centers

Perimeter of Roof (Zone 2): 6 in on-centers

Corners of Roof (Zone 3): 4 in on-centers

##### SOPREMA DUOTACK SPF HFO: Two-component, polyurethane foam insulation adhesive, applied in ribbons from two-component compressed cylinders.

###### Ribbon size: 2-1/2 to 3-1/2 in wide.

###### Ribbon spacing: As required to meet specified wind uplift resistance performance.

Field of Roof (Zone 1’): 12 in on-centers

Field of Roof (Zone 1): 12 in on-centers

Perimeter of Roof (Zone 2): 6 in on-centers

Corners of Roof (Zone 3): 4 in on-centers

#### ASPHALT INSULATION ADHESIVE

##### Type III MOPPING ASPHALT: Approved for use as insulation adhesive, complying with ASTM D312, Type III. The Equiviscous Temperature (EVT), the finished blowing temperature (FBT) and the flash point (FP) shall be indicated on each container.

###### Application Rate: Full coverage, applied at EVT for a nominal rate of 23-25 lbs/square.

##### Type IV MOPPING ASPHALT: Approved for use as insulation adhesive, complying with ASTM D312, Type IV. The Equiviscous Temperature (EVT), the finished blowing temperature (FBT) and the flash point (FP) shall be indicated on each container.

###### Application Rate: Full coverage, applied at EVT for a nominal rate of 23-25 lbs/square.

## ACCESSORIES

### PRIMERS:

#### SOPREMA ELASTOCOL 500 PRIMER: Asphalt cut-back primer. Primer for the preparation of substrates for asphalt applications.

##### Meets or exceeds ASTM D41

##### VOC content: 350 g/L or less.

#### SOPREMA ELASTOCOL 350 PRIMER: Polymer emulsion primer, meeting low VOC requirements for the preparation of substrates for asphalt applications.

#### SOPREMA ELASTOCOL STICK ZERO PRIMER: 0 g/L VOC solvent, self-adhesive membrane primer. Low VOC, solvent-based primer for the preparation of membrane substrates for self-adhered SBS membrane and self-adhesive SBS flashing applications.

#### SOPREMA ELASTOCOL STICK PRIMER: Self-adhesive membrane primer. SBS polymer, resin and, solvent-based primer for the preparation of membrane substrates for self-adhesive SBS membrane and self-adhered SBS flashing applications.

### MOPPING ASPHALT

#### MOPPING ASPHALT pre-approved in writing by membrane manufacturer for use for applying the specified insulation.

##### Application Rate: Solid mopping, full coverage at 23-25 lb per square and as required for specified approvals.

##### Application Temperature: Apply asphalt at the published EVT and no less than 400°F (204°C) at the point of contact when applying the SBS-modified bitumen membrane into the asphalt.

##### The Equiviscous Temperature (EVT), the finished blowing temperature (FBT) and the flash point (FP) shall be indicated on each container.

##### Meets or exceeds ASTM D312, Type IV as listed in Table I.

##### Meets or exceeds ASTM D6152.

### INSULATION FASTENERS AND PLATES

#### SOPREMA #12 DP FASTENER and SOPREMA 3 IN INSULATION PLATE: Insulation system fasteners and metal stress plates.

#### SOPREMA #14 MP FASTENER and SOPREMA 3 IN INSULATION PLATE: Insulation system fasteners and metal stress plates.

#### SOPREMA #15 HD FASTENER and SOPREMA 3 IN INSULATION PLATE: Insulation system fasteners and metal stress plates.

#### SFS isoweld Fastener and Plate: Non-penetrating membrane fastener and plate.

#### TRUFAST Versa-Fast Fastener and Plate: Insulation system fasteners and metal stress plates.

### SOPRASMART BOARD FASTENERS AND PLATES

#### SOPREMA #14 MP Fastener: Membrane base ply fastener.

#### SOPREMA #15 HD Fastener: Membrane base ply fastener.

#### SOPREMA #15 EL Fastener: Membrane base ply fastener.

#### SOPREMA 2 in SEAM PLATE: Membrane base ply seam plate.

#### SOPREMA 2.4 in SEAM PLATE: Membrane base ply seam plate.

# EXECUTION

## EXAMINATION

### Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.

### Conduct qualitative insulation adhesive adhesion tests, or quantitative bonded pull tests as necessary to ensure satisfactory adhesion is achieved.

### The contractor shall examine all roofing substrates including, but not limited to: insulation materials, roof decks, walls, curbs, rooftop equipment, fixtures, and wood blocking.

### The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing materials.

### During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified roofing system.

## PREPARATION

### Before commencing work each day, the contractor shall prepare all roofing substrates to ensure conditions are satisfactory to proceed with the installation of specified roofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securement of substrates, eliminating all incompatible materials, and cleaning.

### Where conditions are found to be unsatisfactory, work shall not begin until conditions are made satisfactory to begin work. Commencing of work shall indicate contractor’s acceptance of conditions.

## PRIMER APPLICATION

### Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified roofing materials.

### Apply primer using brush, roller, or sprayer at the rate published on the product data sheet.

### Asphalt Primer: Apply primer to dry compatible masonry, metal, wood, and other required substrates before applying asphalt.

### Self-Adhesive Membrane Primer: Apply self-adhered primer to dry, compatible substrates as required to enhance adhesion of self-adhesive membrane plies. Ensure self-adhered membrane primer is tacky to-the-touch, but not wet. Primer should not transfer to the fingertips when touched.

### Project conditions vary throughout the day. Monitor changing conditions, monitor the drying time of primers, and monitor the adhesion of the membrane plies. Adjust primer and membrane application methods as necessary to achieve the desired results.

## INSULATION FASTENER APPLICATION

### Fasten [Thermal Barrier][Insulation Base Layer][Insulation][Cover-board] to the deck using specified insulation fasteners and plates.

### Evenly distribute fasteners as required by the board manufacturer’s published requirements.

### Fasten the insulation to meet the specified wind uplift resistance performance requirements and warranty requirements.

### Minimum insulation fastening requirement:

#### Field of Roof (Zone 1’): 1 fastener per 0.00 square ft

#### Field of Roof (Zone 1): 1 fastener per 0.00 square ft

#### Perimeter of Roof (Zone 2): 1 fastener per 0.00 square ft

#### Corners of Roof (Zone 3): 1 fastener per 0.00 square ft

### Minimum insulation fastening requirement:

#### Field of Roof (Zone 1’): 00 fasteners per 4x8 ft board.

#### Field of Roof (Zone 1): 00 fasteners per 4x8 ft board.

#### Perimeter of Roof (Zone 2): 00 fasteners per 4x8 ft board.

#### Corners of Roof (Zone 3): 00 fasteners per 4x8 ft board.

### For insulation and Cover-boards located partially within the defined perimeter and/or corners, install fastening for the entire board as specified herein.

## INSULATION ADHESIVE APPLICATION

### DUOTACK 365

#### Apply the specified two-component insulation adhesive to adhere [Insulation Base Layer][Insulation Layers][Cover-board] to the deck and insulation substrate(s).

#### Follow insulation adhesive product data sheets and published general requirements for installation requirements.

#### Apply insulation adhesive in uniform ribbons, 1/2 in to 3/4 in wide.

#### Immediately install insulation components into insulation adhesive and apply weight to ensure the materials maintain full contact with all ribbons for complete adhesion. Do not allow insulation adhesive to skin-over before placing the insulation materials into the adhesive.

#### Adhere the insulation system to meet the specified wind uplift resistance performance and specified warranty requirements.

#### Minimum insulation adhesive ribbon spacing:

##### Field of Roof (Zone 1’): 12 in on-centers.

##### Field of Roof (Zone 1): 12 in on-centers.

##### Perimeter of Roof (Zone 2): 6 in on-centers.

##### Corners of Roof (Zone 3): 4 in on-centers.

### DUOTACK SPF HFO

#### Apply the specified two-component insulation adhesive to adhere [Insulation Base Layer][Insulation Layers][Cover-board] to the deck and insulation substrate(s).

#### Follow insulation adhesive product data sheets and published general requirements for installation requirements.

#### Apply insulation adhesive in uniform ribbons, 2-1/2 to 3-1/2 in wide.

#### Install insulation components into insulation adhesive and apply weight to ensure the materials maintain full contact with all ribbons for complete adhesion. Do not allow insulation adhesive to skin-over before placing the insulation materials into the adhesive.

#### Adhere the insulation system to meet the specified wind uplift resistance performance and specified warranty requirements.

#### Minimum insulation adhesive ribbon spacing:

##### Field of Roof (Zone 1’): 12 in on-centers.

##### Field of Roof (Zone 1): 12 in on-centers.

##### Perimeter of Roof (Zone 2): 6 in on-centers.

##### Corners of Roof (Zone 3): 4 in on-centers.

## MOPPING ASPHALT APPLICATION

### Fully adhere [Insulation Base Layer][Insulation Layers][Cover-board] to deck and insulation substrate(s) using specified mopping asphalt.

#### Mopping asphalt manufacturer and type shall be preapproved by the manufacturer.

#### Refer to mopping asphalt supplier published values for Softening Point, Minimum Flash Point (FP), Finished Blowing Temperature (FBT) and Equiviscous Temperature (EVT).

#### To avoid risk of fire do not heat asphalt at or above the Flash Point temperature.

#### The EVT is the temperature at which the mopping asphalt viscosity is 125 centistokes.

#### Apply mopping asphalt within +/- 25°F (14°C) of the published EVT to obtain the nominal 23 to 25 pounds per square coverage rate.

#### Refer to the EVT provided by the asphalt supplier. Typically, the Type III asphalt application temperature should be within 365 to 435°F (185 to 224°C) and Type IV asphalt application temperature should be within 400 to 475°F (204 to 246°C) at the point of application when installing roofing materials into the hot asphalt.

#### The contractor shall monitor asphalt application temperature and shall record the temperature during application.

### Install full coverage of mopping asphalt applied at 25-30 lbs./square, and as required to meet specified wind uplift approvals and warranty requirements.

### Immediately install insulation components into hot asphalt and apply weight to ensure the insulation materials maintain full contact with the asphalt for full adhesion.

## INSULATION SYSTEM APPLICATION

### Follow insulation system component product data sheets, published general requirements and, approvals.

### Install all insulation system components on clean, dry, uniform and, properly prepared substrates.

### All insulation system boards shall be carefully installed and fitted against adjoining sheets to form tight joints.

### Insulation system boards that must be cut to fit shall be saw-cut or knife-cut in a straight line, not broken. Chalk lines shall be used to cut insulation components. Uneven or broken edges shall not be accepted. Remove dust and debris that develops during cutting operations.

### Stagger successive layers of insulation 12 in vertically and laterally to ensure board joints do not coincide with joints from the layers above and below.

### Crickets, saddles, and tapered edge strips shall be installed before installing Cover-boards.

### Install tapered insulation, saddles and crickets as required to ensure positive slope for complete roof drainage.

### Cover-boards shall be installed to fit tight against adjacent boards. When required by the Cover-board manufacturer, a uniform gap shall be provided between Cover-boards using a uniform guide placed between board joints to form a gap between all boards during installation.

### The finished insulation system surface shall be tight to, and flush with, adjacent substrates to form a satisfactory substrate to install specified roof membrane and flashings.

### Install specified cants where required for membrane flashing transitions.

## SOPRASMART BOARD APPLICATION

### Adhered SOPRASMART boards:

#### Starting at the low point of the roof, lay out the SOPRASMART boards to ensure the boards are installed perpendicular to the roof slope, shingled to prevent back-water laps.

#### Unfold boards and lay them out on the prepared substrate.

#### Ensure SOPRASMART ends are butted and aligned with the 1 in membrane overlapped onto the adjacent board.

#### Stagger the SOPRASMART joints from the preceding insulation joints to ensure board joints are not aligned vertically.

#### Apply the specified two-component [insulation adhesive][asphalt] to adhere SOPRASMART to the substrate.

#### During installation, ensure the factory DUO-Selvage side-laps are maintained clean and dry.

#### Remove the self-adhesive release film while applying pressure with a weighted roller.

#### Heat-weld the remaining outer 1 in edge of the SOPRASMART side-lap to ensure the side-laps are sealed watertight.

#### Seal end-laps by heat welding the SOPRALAP FLAM or SOPRALAP SP strip-in ply, centered along the end joint.

#### Prime the SOPRASMART end joints using ELASTOCL STICK, ELASTOCOL STICK ZERO and fully adhere SOPRALAP STICK strip-in ply, centered along the end joint.

#### Seal end-laps by adhering the SOPRALAP SANDED strip-in ply, centered along the end joint.

#### Each day, physically inspect all side and end-laps, and ensure the SOPRASMART is sealed watertight. Where necessary, use a roof torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.

#### Repair all voids, wrinkles, open laps, and all other deficiencies before installing subsequent materials above SOPRASMART.

### Fastened SOPRASMART boards:

#### Starting at the low point of the roof, lay out the SOPRASMART boards to ensure the boards are installed perpendicular to the roof slope, shingled to prevent back-water laps.

#### Unfold boards and lay them out on the prepared substrate.

#### Ensure SOPRASMART ends are butted and aligned with the 1 in membrane overlapped onto the adjacent board.

#### Stagger the SOPRASMART joints from the preceding insulation joints to ensure board joints are not aligned vertically.

#### Install fasteners and seam plates within the self-adhesive portion of the side-laps.

#### Ensure spacing between fasteners in the laps meets specified wind uplift resistance requirements.

#### Do not over-drive fasteners. Install fasteners as necessary to firmly set the fastener and seam plate tight against the side-lap. Prevent wrinkles from forming in the side-lap as the fasteners are installed.

#### At the end of the SOPRASMART board where it terminates at roof edges, walls, and curbs, fasten the ends to the deck 12 in on-centers or less.

#### During installation, ensure the factory DUO-Selvage side-laps are maintained clean and dry.

#### Remove the self-adhesive release film while applying pressure with a weighted roller.

#### Heat-weld the remaining 1 in of SOPRASMART side lap to ensure the side-laps are sealed watertight.

#### Seal end-laps by heat welding the SOPRALAP FLAM or SOPRALAP SP strip-in ply, centered along the end joint.

#### Prime the SOPRASMART end joints using ELASTOCL STICK, ELASTOCOL STICK ZERO and fully adhere SOPRALAP STICK strip-in ply, centered along the end joint.

#### Seal end-laps by adhering the SOPRALAP SANDED strip-in ply, centered along the end joint.

#### Each day, physically inspect all side and end-laps, and ensure the SOPRASMART is sealed watertight. Where necessary, use a roof torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.

#### Repair all voids, wrinkles, open laps, and all other deficiencies before installing subsequent materials above SOPRASMART.

## CLEAN-UP

### Clean-up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

END OF SECTION