SECTION 07 30 70
STEEP SLOPE ROOFING UNDERLAYMENTS

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roofing Underlayments of the following types:
   1. Premium high temperature roofing underlayment. (RoofTopGuard II)
   2. High temperature roofing underlayment. (RoofTopGuard SA HT)
   3. Standard synthetic roofing underlayment. (Roofers Choice II Synfelt, Petex 15)
   4. Breathable roofing and wall underlayment. (AirOutshield SA 280, AirOutshield Roof)

B. Wall Underlayment. (AirOutshield Wall, AirOutshield UV, AirOutshield SA 280)

1.2 RELATED SECTIONS

A. Section 06 10 00 - Rough Carpentry.

B. Section 07 31 13 - Asphalt Shingles.

C. Section 07 41 13 - Metal Roof Panels.

D. Section 07 46 16 - Aluminum Siding.

E. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

A. ASTM International (ASTM):
   1. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
   2. ASTM D570 - Standard Test Method for Water Absorption of Plastics.
   3. ASTM D751 - Standard Test Methods for Coated Fabrics.
   4. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
   5. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.
   6. ASTM D1938 - Standard Test Method for Tear-Propagation Resistance, Trouser Tear, of Plastic Film and Thin Sheeting by a Single-Tear Method.
   7. ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
   8. ASTM D2523 - Standard Practice for Testing Load-Strain Properties of Roofing Membranes.
   9. ASTM D4073 - Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes.
   10. ASTM D4518 - Standard Test Methods for Measuring Static Friction of Coating

Surfaces.

11. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
12. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
13. ASTM D4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
14. ASTM D5034 - Standard Test Method for Breaking Strength and Elongation of Textile Fabrics, Grab Test.
15. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
16. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
17. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.
18. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
19. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.
20. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies.

B. Dade County Protocols:
   1. Dade County PA 104 - Test Procedure for Nail-On Underlayments for Use in Discontinuous Roof Systems.
   2. Notice of Acceptance, Miami Dade: NOA 18-0829.08.

C. Deutsches Institut fUr Normung or German Institute for Standardization (DIN):
   1. DIN EN 13859 - Flexible Sheets for Waterproofing - Definitions and Characteristics of Underlays.

D. Florida Building Code (FBC):
   1. FBC: Approval Number FL 27703

E. International Code Council (ICC):
   1. ICC AC 38 - Acceptance Criteria for Water-Resistive Barriers.
   2. ICC/EM AC 48 - Acceptance Criteria for Self-Adhered Roof Underlayments for Use as Ice Barriers.
   3. ICC AC 188 - Acceptance Criteria for Roof Underlayments.
   4. ICC AC 207 - Acceptance Criteria for Polypropylene Roof Underlayments.
   5. ICC-ES: ESR-4384 - Evaluation Report for Underlayment Specialties Plus LLC. RoofTopGuard SA HT.

## 1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data:
   1. Manufacturer's data sheets on each product to be used.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Typical installation methods.

C. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.

## 1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.

B. Installer Qualifications: Company specializing in performing Work of this section with

minimum two years documented experience with projects of similar scope and complexity.

C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
   1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
   2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
   3. Retain mock-up during construction as a standard for comparison with completed work.
   4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.6 PRE-INSTALLATION CONFERENCE

A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.

B. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's standard limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Underlayment Specialties Plus (USP), which is located at: 805 W. 5th St. Unit # 10A; Lansdale, PA 19446; Toll Free Tel: 844-767-4963; Email:request info (info@uspunderlayment.com); Web:https://www.uspunderlayment.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 PREMIUM HIGH TEMPERATURE ROOFING UNDERLAYMENT

A. Performance Requirements:
   1. Approvals:
      a. ICC-ES ESR 2928. For Underlayment Specialties Plus LLC.
      b. FBC: Approval Number FL12145.
      c. ICBO: ITS 484-1932 and 484-2143
      d. CAN/CSA: A220.1

2. Dimensional Stability, tested at 180 degrees F (82 degrees C) for six hours per Dade County PA 104: No tears, cracks, shrinking, or wrinkling.
3. Tear Resistance, per ASTM D1938: Minimum average result of 13.18 pounds (5.978 kg).
4. Breaking Strength, New, per ASTM D2523: Minimum average result of 86.82 pounds (39.38 kg).
5. Elongation, New, per ASTM D2523: Minimum average result of 27 percent.
6. Water Absorption, per ASTM D570: Maximum average result of 2.4 percent.
7. Cold Flexibility, per ASTM 1970: No cracking.
8. Ultraviolet Resistance, per ICC/EM AC 48: No peeling, chipping, cracking, flaking, pitting, or other damage.
9. Accelerated Aging, per Dade County PA 104: No visible damage, passes breaking strength and elongation tests.
10. Cyclic Elongation, per ICC/EM AC 48: No cracking.
11. Water Vapor Transmission, per ASTM E96: Maximum average result of 0.0012 oz/sq.ft. (0.38 g/sq.m.)
12. Puncture Resistance, per Dade County PA 104: No puncture.
13. Slippage Resistance, per Dade County PA 104: No tears, slippage, or pulling away from fasteners.
14. Static Friction, per ASTM D4518: Performs similarly to 30 lb felt.
15. Water Penetration, per ASTM E331: No leakage found around fasteners when secured per instructions.
16. Fire Rating, per ASTM E108 and ICC AC 207: Class A.

B. Basis of Design: RoofTopGuard II; as supplied by Underlayment Specialties Plus LLC.
1. Description: High-strength performance roofing underlayment used on steep-sloped roofs.
2. Composition: Woven HDPE with a polyethylene film laminated with black LDPE on one side and, a nonwoven polypropylene layer laminated with LDPE on the other side.
3. Roll Width: 60 inches (1524 mm).
4. Roll Length: 200 feet (60,960 mm).
5. Color: Gray.

C. Accessories:
1. Sealant: Asbestos free plastic roofing cement compliant with ASTM D4586, Type I.
2. Fasteners: Plastic or steel cap roofing nails with minimum 1 inch (25 mm) caps.

2.3 HIGH TEMPERATURE ROOFING UNDERLAYMENT

A. Performance Requirements:
1. Certifications:
a. Evaluation Report: ICC-ES: ESR-4384. For Underlayment Specialties Plus LLC.
b. Notice of Acceptance, Miami Dade: NOA 18-0829.08.
c. FBC: Approval Number FL 27703.
2. Tensile Strength, per ASTM D1970 and ASTM D2523: 71 lbf/in (12 N/mm).
3. Pliability, per ICC/EM AC 48: Pass.
4. Water Ponding, per ICC/EM AC 48: Pass.
5. Cycling and Elongation, per ICC/EM AC 48: Pass.
6. UV Exposure, per ICC/EM AC 48: Pass.
7. Adhesion to Plywood at 40 degrees F (4.4 degrees C), per ASTM D903: 95 lbf/ft (1.4 N/mm).
8. Adhesion to Plywood at 75 degrees F (24 degrees C), per ASTM D903: 35 lbf/ft (0.51 N/mm).
9. Thermal Stability, per ASTM D1970: Pass.

10. Tear Resistance, per ASTM D4073: 128 lbf (569 N).
11. Sealability around Nail, per ASTM D1970: Pass.
12. Waterproof Integrity after low Temp Flex, per ASTM D1970: Pass.
13. Waterproof Integrity of Seam, per ASTM D1970: Pass.
14. Water Vapor Transmission, per ASTM E96: 0 perm.
15. Slip Resistance, per ASTM D1970: Greater than felt.

B. Basis of Design: RoofTopGuard SA HT; as manufactured and supplied by Underlayment Specialties Plus LLC.
1. Description: Synthetic based, high-temperature, self-adhered ice and water roof underlayment used in steep slope applications.
2. Composition: Polyethylene and polypropylene.
3. Thickness: 0.026 inches (0.66 mm).
4. Roll Width: 59 inches (1499 mm).
5. Minimum Installation Temperature: 15 degrees F (Minus 9.4 degrees C).
6. Service Temperature: Minus 20 to 260 degrees F (Minus 29 to 127 degrees C).

2.4 STANDARD SYNTHETIC ROOFING UNDERLAYMENT

A. Basis of Design: Roofers Choice II Synfelt; as manufactured and supplied by Underlayment Specialties Plus LLC.
1. Performance Requirements:
a. Meets ASTM E108, Class A fire rating.
2. Description: High strength and high temperature performance roofing underlayment used on steep sloped roofs.
3. Composition: Woven HDPE fabric extrusion coated with a high coefficient of friction polyolefin blended with carbon black providing a skid-resistant finish on one side, laminated to a non-woven polypropylene fabric surface with LDPE on the other side.
4. Roll Width: 60 inches (1524 mm).
5. Roll Length: 200 feet (60,960 mm).
6. Color: Gray.

B. Basis of Design: Petex 15; as manufactured and supplied by Underlayment Specialties Plus LLC.
1. Performance Requirements:
a. Tensile Strength, per ASTM D751: Minimum 78 lb (35 kg).
b. Elongation, per ASTM D751: Minimum 14 percent.
c. Tear Strength, Trapezoidal, per ASTM D4533: Minimum 26 lb (12 kg).
d. Liquid Water Resistance, per ASTM D4869: Pass.
e. UV Exposure, per ICC AC 188: Pass.
f. Pliability, per ASTM D226: Pass.
2. Description: High strength performance roofing underlayment used on steep sloped roofs.
3. Composition: Woven HDPE fabric extrusion coated with a high coefficient of friction polyolefin blended with carbon black providing a skid-resistant finish on one side, laminated to a non-woven polypropylene fabric surface with LDPE on the other side.
4. Roll Width: 60 inches (1524 mm).
5. Roll Length: 200 feet (60,960 mm).
6. Thickness: 0.007 inches (0.18 mm).
7. Service Temperature: Minus 20 to 180 degrees F (Minus 29 to 82 degrees C).

2.5 BREATHABLE ROOFING UNDERLAYMENT

A. Basis of Design: AirOutshield SA 280; as supplied by Underlayment Specialties Plus LLC.
1. Performance Requirements:
a. Water Vapor Permeance, per ASTM E96 - A: 12.6 perms.
b. Air Leakage Resistance, per ASTM E2357: Less than 0.05.

c. Flame Spread Index, per ASTM E84: 5.
d. Smoke Developed Index, per ASTM E84: 5.

2. Description: Fully self-adhered, micro-porous film laminate.
3. Composition: Triple layer, spun bonded polypropylene.
4. Roll Width: 57 inches (1448 mm).
5. Thickness: 0.024 inch (0.60 mm).
6. Color: Black.
7. Minimum Installation Temperature: 20 degrees F (Minus 6.7 degrees C).
8. Service Temperature: Minus 40 to 212 degrees F (Minus 40 to 100 degrees C).
9. Accessory Materials:
   a. Detail Tape: As recommended by Manufacturer.
   b. Eave Protection: Self adhered membrane.
   c. Eave Protection: High Temperature resistant underlayment.
   d. Fasteners: As recommended by Manufacturer.
   e. Ventilation Mat: Non-woven nylon with maximum 20 percent contact area or battens.

B. Basis of Design: AirOutshield Roof; as supplied by Underlayment Specialties Plus LLC.
1. Performance Requirements:
   a. Water Vapor Transmission, per ASTM E96: 119 perms.
   b. Liquid Water Transmission, per ASTM D4869: Pass.
   c. Pliability, per ASTM D226: Pass.
   d. Accelerated Aging, per ICC AC 48: Pass.
   e. UV Exposure, per ICC AC 48: Pass.
2. Description: Breathable roofing underlayment.
3. Composition: Multi-layer, spun bonded polypropylene.
4. Roll Width: 57 inches (1448 mm).
5. Thickness: 0.024 inch (0.60 mm).
6. Color: Black.
7. Accessory Materials:
   a. Detail Tape: As recommended by Manufacturer.
   b. Eave Protection: Self adhered membrane.
   c. Eave Protection: High Temperature resistant underlayment.
   d. Fasteners: As recommended by Manufacturer.
   e. Ventilation Mat: Non-woven nylon with maximum 20 percent contact area.

2.6 WALL UNDERLAYMENT

A. Basis of Design: AirOutshield Wall; as supplied by Underlayment Specialties Plus LLC.
1. Performance Requirements:
   a. Water Vapor Permeance, per ASTM E96 - A: 156.1 perms.
   b. Tensile Strength, per ASTM D882: 27.4 lbf/in (4.79 N/mm).
   c. Breaking Force, MD, per ASTM D5034: 77.6 lbf (345 N).
   d. Flame Spread Index, per ASTM E84: 20.
   e. Smoke Developed Index, per ASTM E84: 185.
   f. Low Temperature Flexibility, per ICC AC 38: Pass.
   g. UV Exposure, per ICC AC 38: Pass.
   h. Accelerated Aging, per ICC AC 38: Pass.
   i. Water Ponding, per ICC AC 38: Pass.
   j. Air Permeance, per ICC AC 38: No air leakage at 75 Pa.
2. Description: Breathable underlayment for rain screen wall systems, used as a secondary drainage plane.
3. Composition: Triple layer, spun bonded polypropylene.
4. Thickness: 0.023 inch (0.58 mm).
5. Color:
   a. Top: Orange.

b. Bottom: White.

6. Accessory Materials:
   a. Tapes: As recommended by Manufacturer.
   b. Detail Membrane Flashing: SRP AirOutshield SA 280 flashing.
   c. Sealant/Adhesive: As recommended by Manufacturer.
   d. Fasteners: As recommended by Manufacturer.
   e. Ventilation Mat: Non-woven nylon with maximum 20 percent contact area.

B. Basis of Design: AirOutshield UV; as supplied by Underlayment Specialties Plus LLC.
1. Performance Requirements:
   a. Water Vapor Permeance, per ASTM E96 - A: 26.9 perms.
   b. Fire Classification, per ASTM E84: Class A.
   c. Air Permeance, per ASTM E2178: 0.0001 cfm/sq.ft. (0.0005 L/s.sq.m.) at 75 Pa.
   d. UV Resistance, per DIN EN-13859: 5000 hours exposure with a reduction in tensile of less than 5 percent.
2. Description: Water and UV resistant, breathable underlayment for open joint rain screen wall systems.
3. Composition: Double layer, coated polyester.
4. Roll Width: 59 inches (1.5 m).
5. Roll Length: 164 feet (50 m).
6. Thickness: 0.023 inch (0.58 mm).
7. Color: Black.
8. Accessory Materials:
   a. Tapes: As recommended by Manufacturer.
   b. Self-Adhered Membrane: Regular temperatures.
   c. Self-Adhered Membrane: High temperature.
   d. Fasteners: As recommended by Manufacturer.
   e. Ventilation Mat: Non-woven nylon with maximum 20 percent contact area.

C. Basis of Design: AirOutshield SA 280; as supplied by Underlayment Specialties Plus LLC.
1. Performance Requirements:
   a. Water Vapor Permeance, per ASTM E96 - A: 12.6 perms.
   b. Air Leakage Resistance, per ASTM E2357: Less than 0.05.
   c. Flame Spread Index, per ASTM E84: 5.
   d. Smoke Developed Index, per ASTM E84: 5.
2. Description: Fully self-adhered, micro-porous film laminate.
3. Composition: Triple layer, spun bonded polypropylene.
4. Roll Width: 57 inches (1448 mm).
5. Thickness: 0.024 inch (0.60 mm).
6. Color: Black.
7. Minimum Installation Temperature: 20 degrees F (Minus 6.7 degrees C).
8. Service Temperature: Minus 40 to 212 degrees F (Minus 40 to 100 degrees C).
9. Accessory Materials:
   a. Detail Tape: As recommended by Manufacturer.
   b. Eave Protection: Self adhered membrane.
   c. Eave Protection: High Temperature resistant underlayment.
   d. Fasteners: As recommended by Manufacturer.
   e. Ventilation Mat: Non-woven nylon with maximum 20 percent contact area or battens.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Do not begin installation until substrates have been properly constructed and prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

C. Roof Underlayments: Verify that proper roof slope exists.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   1. Prepare penetrations as recommended by Manufacturer.
   2. Treat seams and joints as recommended by Manufacturer.
   3. Install flashings and detail membranes as recommended by Manufacturer.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

3.5 CLEANING AND PROTECTION

A. Clean products in accordance with the manufacturer's recommendations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION