SECTION 07 31 13

ASPHALT SHINGLES

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. A. High profile laminate asphalt shingles.
   1. Legacy Scotchgard

B. Underlayment and accessories.

C. Vented nail base insulated panels.

1.2 RELATED SECTIONS

A. Section 02 41 16.13 - Building Demolition.

B. Section 06 10 00 - Rough Carpentry.

C. Section 07 61 00 - Sheet Metal Roofing.

1.3 REFERENCES

A. ASTM International (ASTM):
   1. ASTM C209 - Standard Test Methods for Cellulosic Fiber Insulating Board.
   2. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
   3. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
   4. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
   5. ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
   6. ASTM D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
   7. ASTM D3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
   8. ASTM D3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
   9. ASTM D3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
   10. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos- Free.
   11. ASTM D4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
   12. ASTM D4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
   13. ASTM D6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.
   14. ASTM D7158 - Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method).

15. ASTM D8257 - Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing.
16. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
17. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
18. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.

B. Canadian Standards Organization (CSA).
1. CSA A123.5 - Asphalt Shingles.
2. CSA A123.3 - Underlayment.
3. CSA A220.1 - Concrete Roof Tiles.

C. Florida Building Code (FBC).
1. FL14807 - Underlayments.
2. FL14809 - Asphalt Shingles.
3. FL23186 - Underlayments.
4. FL36890 - Asphalt Shingles.

D. ICC Evaluation Service (ICC-ES).
1. ICC Approval - ESR-1561: Roofing Felt and Underlayment.
2. ICC Approval - ESR-3150: Asphalt Shingles.
3. ICC-ES AC188: Acceptance Criteria for Roof Underlayments.
4. ICC-ES AC438: Acceptance Criteria for Asphalt Shingles.

E. Intertek Testing Services (ITS).
1. Fire Resistance Directory, Current Edition.
2. Code Compliance Research Report - CCRR-1082: Roofing Felt and Underlayment.
3. Code Compliance Research Report - CCRR-0537: Synthetic Underlayment.

F. PRI Construction Materials Technologies, LLC (PRI).
1. Evaluation Reports (ERs) for asphalt shingles.

G. Underwriters Laboratory (UL).
1. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
2. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.

1.4 SUBMITTALS

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

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

C. Samples for Selection: For the following products, of sizes indicated: For each product specified, two complete sets of color samples representing manufacturer's full range of available colors and patterns.
1. Asphalt Shingles: Full size.
2. Asphalt Starter Shingles: Full size.
3. NEX Polymer Modified Fiberglass Hip and Ridge Shingles: Full size.
4. Synthetic Underlayment: 12 inches (305 mm) square.
5. NEX Polymer Modified Self-Adhering Fiberglass Reinforced Underlayment: 12 inches (305 mm) square.
6. NEX Polymer Modified Fiberglass Reinforced Underlayment: 12 inches (305 mm) square.
7. Nails Used for Fastening Shingles: 5 of each nail type and size.

D. Samples for Verification: For the following products, of sizes indicated: For each product specified, two samples representing actual product, color, and patterns.
   1. Asphalt Shingles: Full size.
   2. Asphalt Starter Shingles: Full size.
   3. NEX Polymer Modified Fiberglass Hip and Ridge Shingles: Full size.
   4. Synthetic Underlayment: 12 inches (305 mm) square.
   5. NEX Polymer Modified Self-Adhering Fiberglass Reinforced Underlayment: 12 inches (305 mm) square.
   6. Nail Used for Fastening Shingles: 5 of each nail type and size.

1.5 QUALITY ASSURANCE

A. Primary Roofing Materials Manufacturer Requirements:
   1. Manufacturer specified asphalt shingles for a minimum of ten years.
   2. Manufacturer shall be an associate member in good standing of either the National Roofing Contractors Association (NRCA), Western States Roofing Contractors Association (WSRCA), or the Midwest Roofing Contractors Association (MRCA).

B. Installer Qualifications: Approved by the manufacturer to install the specified products and provide the specified warranties.

C. Source Limitations: Obtain hip and ridge shingles, starter, all underlayment products, insulation, and vented nail base from a single source, from single manufacturer.

D. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

E. Exterior Fire-Test Exposure: Class A; ASTM E108 or UL 790, for application and roof slopes indicated.

F. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 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 absolute limits.

1.8 PROJECT MEETINGS

A. Pre-Construction Meeting:

1. Prior to the start of the roofing project, the Owner will hold a job-site meeting and roof tour to review the scope of work.
2. Authorized representatives of the Owner, the Roofing Contractor (Project Superintendent), the asphalt shingle manufacturer, other Subcontractors whose work complements, penetrates, or is mounted on the roof or will use the roof as a work platform, will be in attendance.
3. The agenda for the meeting shall include:
    a. A review of the submittals.
    b. Distribution of approved submittals.
    c. A walkover inspection of the roof.
    d. Establishment of a schedule for the work.
    e. Selection of staging and storage locations.

B. Final Inspection: Following the completion of the work, a final inspection shall be scheduled by Owner's Representative. Any uncompleted work shall be noted on a punch list. Final payment shall be made only after punch list is completed.

1.9 WARRANTY

A. Standard Shingle Warranty: Shingles subjected to terms and conditions of the Standard Manufacturer's Limited Warranty.

1. Manufacturing Defect Warranty Length: 50 years.
2. Limited Term Resistance to Wind: 110 mph (177 kph) for 15 years.
3. Limited Term Resistance to Wind: 130 mph (209 kph) for 15 years
3. Scotchgard Protector Limited warranty shall include 3M Scotchgard algae resistance to discoloration from blue-green algae (Gloeocapsa spp) growth for a Limited Lifetime period from the date of substantial completion.

B. Upon project completion and acceptance by Owner, the Roofing Contractor shall promptly provide executed copies of the specified warranties.

C. Furnish a list containing the names, contact telephone numbers, email and mailing addresses of the Roofing Contractor, Project Manager, Project General Contractor, Project Architect, and Building Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Malarkey Roofing Products, which is located at: 3131 N. Columbia Blvd. P.O. Box 17217; Portland, OR 97217; Toll Free Tel: 800-545-1191; Tel: 503-283-1191; Fax: 503-289-7644; Email: request info (john.kouba@amrize.com) or linda.mccandless@amrize.com; Web: WWW.MALARKEYROOFING.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 SHINGLES

A. High Profile Laminate Shingles:

1. Legacy Scotchgard Protector, manufactured by Malarkey Roofing Products.
    a. Malarkey Legacy Scotchgard Protector shingles hold a Class A Fire Rating.
    b. As manufactured, Legacy meets the requirements of:
        1) ASTM D7158 Class H, ASTM D3462, ASTM D3161 Class F, ASTM D3018 Type I, ASTM E108 Class A, UL 2218 Class 4 Impact Resistance, ICC-ES AC438, and CSA A123.5.
        2) ICC Approval: ESR-3150.
        3) FBC Approval: No. 14809.
        4) Listed with UL and Intertek/WHI.
    c. Performance:
        1) Limited Lifetime Warranty; Other Structures: 50 years.
        2) Limited Wind Warranty: 15 years. 110 mph (177 kph).
        3) Enhanced Wind Warranty Available: 15 years. 130 mph (209 kph).
        4) Limited Lifetime Scotchgard Protector Warranty.
        5) Right Start Period: 20 years.
        6) NEX polymer mix includes recycled rubber and plastics.
        7) SEBS polymer modified asphalt laminate adhesive.
        8) SEBS asphalt seal-down adhesive.
        9) 3M Smog-Reducing Granules.
        10) Enlarged nailing area of The Zone

2.3 UNDERLAYMENT

A. NEX Polymer Modified, Self-Adhering Fiberglass Underlayment: Ice & Water
    1. Product: Malarkey **401 Arctic Seal**.
    2. As manufactured, 401 Arctic Seal meets the requirements of ASTM D1970.
    3. Self-adhering sheet shall be nominal 65 mils (1.7 mm) thick.
    4. Self-adhering sheet shall be 36 inches (0.91 m) in width.
    5. Two (2) square roll.
    6. NEX polymer mix includes recycled rubber and plastics.

B. Synthetic Underlayment:
    1. Product: **1029 Secure Start Lite**.
    2. As manufactured, Secure Start Lite meets the requirements of ASTM D226, ASTM D4869, ASTM D8257, ASTM E108 Class A, ICC-ES AC188, and CAN/CSA A220.1.
    3. FBC Approval: FL23186.
    4. Code Approval: CCRR-0537.
    5. Sheet shall be nominal 7 ±1 mils (0.2 mm) thick.
    6. Sheet shall be 48 inches (1.2 m) in width.
    7. Ten (10) square roll.

C. Synthetic Underlayment:
    1. Product: Malarkey 1031 Secure Start Plus.
    2. As manufactured, Secure Start Plus meets the requirements of ASTM D226, ASTM D4869, ASTM D8257, ASTM E108 Class A, and CAN/CSA A123.3.
    3. FBC Approval: FL23186.
    4. Code Approval: CCRR-1082.
    5. Sheet shall be nominal 17 ±1 mils (0.43 mm) thick.
    6. Sheet shall be 48 inches (1.2 meter) in width.
    7. Ten (10) square roll.

D. Synthetic Underlayment:
    1. Product: Malarkey 1040 Secure Start **Permeable.**

2. As manufactured, Secure Start Permeable meets the requirements of ASTM D4869, ASTM D8257, ASTM E108 Class A, ICC-ES AC188, and CAN/CSA A220.1.
3. FBC Approval: FL23186.
4. Code Approval: CCRR-0537.
5. Sheet shall be nominal 32 mils (0.8 mm) thick.
6. Sheet shall be 48 inches (1.2 meter) in width.
7. Ten (10) square roll.

2.5 RELATED PRODUCTS

A. NEX Polymer Modified 8 inches (203 mm) High-Profile Hip and Ridge: Malarkey No. 222 EZ-Ridge Scotchgard.

B. NEX Polymer Modified 10 inches (254 mm) High-Profile Hip and Ridge: Malarkey No. 224 EZ-Ridge XT Scotchgard.

C. NEX Polymer Modified 10 inches (254 mm) Hip and Ridge: Malarkey No. 225 RidgeFlex Scotchgard.

D. NEX Polymer Modified 12 inches (305 mm) Hip and Ridge: Malarkey No. 227 RidgeFlex Scotchgard.

E. NEX Polymer Modified Full-Width Perforated Starter Shingle: Malarkey Smart Start No. 210.

F. NEX Polymer Modified Full-Width Starter Shingle: Malarkey Windsor Starter No. 212.

G. Plastic Roof Cement conforming to ASTM D4586.

H. Fasteners: Hot Dip Galvanized nails with minimum 3/8 inch (9.5 mm) head.

PART 3 EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING IMPORT

A. New and dry roof materials delivered to the job site in unopened and undamaged containers. Manufacturer's products stamped with labels, names, and run codes of manufacture and testing laboratory.

B. Store underlayment materials on ends only. Discard rolls which may have been flattened, creased, or otherwise damaged. Place materials on pallets or wood sleepers. Do not stack palletized materials.

C. Cover underlayment rolls with weatherproof materials secured to prevent materials from becoming exposed to moisture. Use breathable tarps.

D. Disperse materials stored on the roof surface to avoid concentrated loading. Set larger concentrations over structural members.

3.2 ENVIRONMENTAL REQUIREMENTS

A. Application of roofing materials shall not be performed when weather conditions interfere with good roofing practices.

3.3 UNDERLAYMENT AND EDGING

A. Apply specified underlayment as follows:
1. Slopes of 5 units in 12 units or greater, apply single layer, polymer modified fiberglass

or synthetic underlayment laid parallel to eaves, lapping to the 2 inch (51 mm) or 4 inch (102 mm) ply line, and 6 inches (152 mm) on ends, end laps staggered 6 feet (1829 mm) from course to course.

2. Slopes of 5 units in 12 units or greater in ice dam regions, apply single layer, self-adhering, polymer modified underlayment along eaves to a point 24 inches (610 mm) beyond the interior surface of exterior walls. From there, apply single layer polymer modified fiberglass or synthetic underlayment, lapping over self-adhering underlayment a minimum of 6 inches (152 mm) and continuing up roof, lapping to the 2 inch (51 mm) or 4 inch (102) ply line.
3. Slopes of less than 5 units in 12 units, apply double layer of specified underlayment laid parallel to eaves, installed shingle fashion with 50% side laps and 6-inch (152 mm) end laps.
4. Slopes of less than 5 units in 12 units in ice dam regions, apply single layer of self-adhering underlayment along eaves to a point 24 inches (610 mm) beyond the interior surface of exterior walls. From there, apply double layer, polymer modified fiberglass or synthetic underlayment, lapping over self-adhering underlayment a minimum of 6 inches (152 mm) and continuing up roof with 50% side laps and 6-inch (152 mm) end laps.
5. In ice dam regions, application of self-adhering underlayment is recommended on the rake edges of roof following eave application.

B. Valleys: Only those valley installations listed in the manufacturer's installation instructions shall be permitted.
1. Regardless of valley method used, begin application by centering a full-width valley liner of self-adhering underlayment to the roof deck in all valleys.
2. The field underlayment is then woven through the valley or lapped 6 inches (152 mm) on each side of the valley liner. If fastening the field underlayment, be aware no fasteners are allowed within 6 inches (152 mm) of the valley centerline.

C. Pipe Flashing: Apply ASTM D1970 underlayment around the pipe, sealing it to the field underlayment prior to installing the metal pipe flashing. Install and secure the metal jack so the bottom flange laps over onto the shingles. Side and top flanges shall have shingles lapping onto the flange. Shingles that lap onto flanges shall be sealed to the metal with asphalt roof cement conforming to ASTM D4586.

D. Perimeter Flashing: Use non-corrosive, 26-gauge (0.55 mm) sheet metal drip edge flashing. Install prior to underlayment on eave edges of roof and then along rake edges over the ends of installed underlayment. Install drip edge with flanges large enough (recommend 4-inch (102 mm) flanges) to completely cover roof edges. Secure with galvanized (or compatible) roofing nails, centered on the top flange at 8 to 10 inches (203 to 254 mm) O.C. or according to local code requirements.

3.4 APPLICATION OF SHINGLES

A. Laminate Shingle Application; 8 inches (203 mm) Offset - Diagonal Pattern:
1. Starter courses: Install Malarkey Smart Start starter shingles; apply to eave and rake edges of roof.
2. Cut 6 inches (152 mm) off the length of the first starter shingle and apply at a lower corner of roof. The starter course shall overhang the edge metal 1/4 to 3/4 inch (6 mm to 19 mm). Fasten with four (4) nails, 1-1/2 inches to 3 inches (38 to 76 mm) up from the eave with one fastener 1 inch (25 mm) from each end and the remaining two evenly spaced on the same line as the end fasteners.
3. Continue starter course across the roof with full-length shingles, butting them loosely together to avoid buckling.
4. First course: Start with a full-length shingle applied directly over the starter course at the same lower corner of the roof, and secure with fasteners.
5. Second course: Cut 8 inches (203 mm) off one end of a full shingle and apply the

remaining piece over the underlying, first course shingle. Align the bottom edge along a line level with the “sawtooth” overlay in the preceding course, exposing the first course 5-5/8 inches (143 mm). Secure with fasteners.

6. Succeeding Courses: Courses three through five are begun with partial shingles, each progressively 8 inches (203 mm) shorter, establishing the overall diagonal pattern or stair-step effect. (Pieces cut from shingles along one rake edge can be used to finish off courses on the opposite rake.)
7. Apply a full shingle adjacent to each of the first five courses to extend the pattern. Butt the shingles loosely together to prevent buckling.
8. Courses six through ten repeat the process beginning with a full shingle and repeating the 1-to-5 course cycle on up the roof.
9. Strike a chalk line every six courses or so to ensure straight courses. Shingles may be laid from either lower corner of the roof. Start at the rake edge and follow layout and cutting instructions as required for proper application. Installation of shingles with a 4-inch (102 mm) offset is also acceptable. Offsets must be no less than 4 inches (102 mm).

B. Valley Installation:

1. Valley Underlayment: Center a full-width strip of self-adhering underlayment (or equivalent conforming to ASTM D1970) in the valley and apply it directly to the roof deck. Ensure this valley liner is tight to the deck without bridging in the center of the valley. Apply the field underlayment across the valley liner and up the opposite side at least 12" (305 mm) or overlap the valley liner a minimum of 6 inches (152 mm) on each side. When fastening, none should be placed closer than 6 inches (152 mm) from the valley centerline.
2. Closed-cut valleys: Lay a first course of shingles along the eave on one side of the roof, and continue it across the valley and onto the adjoining roof a minimum of 12 inches (305 mm). Press shingles well into the break of the valley and fasten no closer than 6 inches (152 mm) from the valley centerline. Add a fastener in the upper corner of the last shingle crossing the valley. Repeat this process with the first course of shingles on the intersecting roof. Note: The first course of shingles is the only one woven in this fashion. Return to the side of the roof you began with, and resume laying shingle courses across the valley and onto the adjoining roof. Complete installation of shingles on that roof face. Snap a chalk line 2 inches (51 mm) from the centerline of the valley on the unshingled side, and begin applying shingle courses there, trimming the ends diagonally to match the centerline angle. Crop the tops of each valley shingle at a 1 inch (25 mm), 45 degree cut. Embed the ends of the cut valley shingles in a continuous 3 inch (76 mm) wide bead of asphalt roof cement.
3. Open metal valleys: Install minimum 24 inches (610 mm) wide, 26-gauge, metal valley flashing over the valley liner, and secure with fasteners no more than 1 inch (25 mm) from the outside edges at a spacing of 10 inches (254 mm) to 12 inches (305 mm) on center. For additional sealing, a continuous, 6-inch (152 mm) wide stripping ply of self-adhering Arctic Seal may be applied over the fasteners. Overlaps in the metal should be a minimum of 4 inches (102 mm) and embedded in a continuous bead of sealant. Do not fasten the metal laps. Lay a first course of shingles along the eave of one roof area and over the valley, making sure the end of the last shingle meets or goes beyond the centerline of the metal valley. Complete the installation of shingles on that roof section. After all shingles have been installed in the valley, snap a chalk line 2 inches (51 mm) from the center of the metal valley, and trim shingles to the chalk line, matching the centerline angle. Crop the tops of each shingle course at a 1 inch (25 mm), 45 degree cut. Embed the ends of the cut valley shingles in a continuous 3 inch (76 mm) wide bead of mastic. Install shingles on the adjoining roof as described above.
4. “Bleeder,” “Point,” or “California-cut” valleys are not acceptable.

3.5 FASTENERS

A. Laminate Nailing Pattern: Nails must be placed within the nailing zone, 1 inch (25 mm) in from each end of the shingle and the remaining nails evenly spaced on the same line as the end nails. Fasteners shall be seated flush to the shingle surface and not overdriven to cut into shingles. When fastening, butt shingles loosely together to prevent buckling.
   1. Fasteners per shingle: Four (4).
   2. Steep slope fastening (roof decks > 21:12): Six (6), including starter shingles, and hand-sealing underneath with ASTM D4586 asphalt roof cement.

END OF SECTION