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EMPIRE SLATE™ ECOSTAR GOLD STAR ROOF SYSTEM

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PART 1 – GENERAL

1.01 DESCRIPTION

- A. Furnish and install Empire Slate tile roofing system as specified in the Contract Documents and roof plan.
- B. Furnish and install this Empire Slate tile roofing system in strict accordance with specifications and drawings approved by EcoStar.
- C. Related Work
 - 1. Metal flashing work is not covered in this specification since EcoStar does NOT warrant metal flashing. EcoStar advises that metal flashing and securement of metal should be to industry standards (SMACNA) to prevent the metal from pulling free or buckling. EcoStar also suggests that all flashing metal be stainless steel or copper (see 3.03D).
 - 2. Roof ventilation products are not covered by the EcoStar Gold Star warranty. EcoStar advises that a ridge style venting system be utilized to ensure the best possible air movement and to provide the best aesthetic appearance to the roofing system. If a ridge ventilation system is not to be used on the project, another form of ventilation may be used.

1.02 QUALITY ASSURANCE

- A. To qualify for an EcoStar Gold Star warranty, an authorized EcoStar Gold Star applicator must install system.
- B. There shall be no deviation made from this specification without written approval from EcoStar prior to the start of the roofing project.
- C. For an EcoStar Gold Star warranty, upon completion of the installation, an inspection must be conducted by a Field Service Representative of EcoStar to ascertain that the roofing system has been installed according to EcoStar's published specifications and details at time of bid. This inspection is not intended to be a final inspection for the benefit of the owner, but for the benefit of EcoStar to determine whether a warranty shall be issued.
- D. It is the Authorized Gold Star Applicator's responsibility to adhere to all applicable building codes (local and national) and to have or acquire the appropriate licenses and permits for the roofing system installation requirements and limitations in their local areas applicable at the time of the bid.
- E. Specific testing requirements:
 - 1. Class A & C Fire Resistance – UL 790 Test Standard
 - 2. Class 4 Impact Resistance – UL 2218 Test Standard
 - 3. ASTM D3161 – 110 mph Wind Test

1.03 SUBMITTALS

- A. Submit an “EcoStar Gold Star Pre-Project Survey” to EcoStar’s technical department for approval PRIOR to project bid and the job start to enable the technical department to approve and assign a job number to the project.
 - 1. The “EcoStar Gold Star Pre-Project Survey Form” must be filled out completely and accurately to include any prior deviations approved from this specification, including a roof drawing showing all dimensions, all penetrations and roof slope.
- B. When an EcoStar Gold Star Warranty is desired, EcoStar must be contacted PRIOR to project bid and installation. Information will be required for wind speeds greater than 90 mph (145 kph) and deviation from standard slope requirements.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original unopened packages.
- B. Packages shall be labeled with manufacturer’s name, brand name and identification of various items.
- C. Empire Slate tiles may not be installed if the tiles have been stored in temperatures lower than 45°F (7°C). If tiles have been stored in temperatures below 45°F (7°C), tiles must be brought back to a material temperature of 45°F (7°C). As the temperature rises, Empire Slate tiles will expand beyond the designed installation pattern if the product is installed while cold or frozen.
- D. Store all materials in a dry protected area. Damaged materials must NOT be used. Installed materials found to be damaged shall be replaced at Gold Star Authorized Applicator’s expense.

1.05 JOB CONDITIONS (CAUTIONS AND WARNINGS)

- A. Contact the EcoStar technical department for procedures when installing an Empire Slate tile roof system during temperatures lower than 45°F (7°C).
- B. Do not install the Empire Slate tile roof system directly over existing asphalt shingles or existing tile roof systems. All existing roof materials MUST be removed prior to installation of the Empire Slate tile roof system.
- C. Roofing surface must be free of ice, water, or snow prior to and during the roofing project.
- D. Decking materials must be dimensionally stable prior to installing the Empire Slate tiles. If the materials are not dry, EcoStar recommends installing the underlayment and allowing the roof to dry out before installing Empire Slate tiles.

1.06 WARRANTY

- A. EcoStar will provide the Gold Star warranty for those materials supplied by EcoStar when an authorized EcoStar Gold Star Applicator completes the project and all required materials have been utilized within the roof system.
- B. Only when an EcoStar Field Service Representative has inspected and approved the completed installation will an EcoStar Gold Star warranty be issued.

- C. The warranty is available for most types of buildings and structures.
- D. The warranty period is expressed on the warranty certificate, which reflects the inclusive dates of coverage.
- E. The warranty does NOT cover the aesthetic appearance of the Empire Slate roof installation. It is the responsibility of the EcoStar Authorized Gold Star Applicator to ensure that color/shading and quality of workmanship meets the aesthetic expectations of the home/building owner.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All components of the Empire Slate Gold Star roof system are to be products manufactured or supplied by EcoStar LLC.

NOTE: Only products supplied by EcoStar LLC are included in the warranty unless otherwise specified and approved in writing by EcoStar LLC.

2.02 TILES

- A. Empire Slate tiles are made of a thermoplastic polyolefin compound with appropriate colorants and UV stabilizers, at 10" (254 mm) or 12" (305 mm) widths by 18" (457 mm) long, and with a tapered nominal thickness of 1/4" (6 mm).

Weight shall be determined by the following acceptable tile exposures:

12" Tiles

[] 7" (178 mm)	=	300 - 320 lbs. (136 - 145 kg) per square
[] 6-1/2" (165 mm)	=	325 - 345 lbs. (147 - 156 kg) per square
[] 6" (152 mm)	=	350 - 370 lbs. (159 - 168 kg) per square

10" Tiles

[] 7" (178 mm)	=	269 - 289 lbs. (122 - 131 kg) per square
[] 6-1/2" (165 mm)	=	290 - 310 lbs. (132 - 141 kg) per square
[] 6" (152 mm)	=	313 - 333 lbs. (142 - 151 kg) per square

B. Empire Slate tile color selection shall be made prior to bid opening and shall conform to one or more of the following colors:

- | | | |
|--|--|---|
| <input type="checkbox"/> Bedford Black | <input type="checkbox"/> Manhattan Midnight | <input type="checkbox"/> Freeport Federal |
| <input type="checkbox"/> Saranac Smoke | <input type="checkbox"/> Geneva Grove | <input type="checkbox"/> Fairport Fern |
| <input type="checkbox"/> Hampton Harbour | <input type="checkbox"/> Auburn Acorn | <input type="checkbox"/> Monticello Merlot |
| <input type="checkbox"/> Plymouth Patina | <input type="checkbox"/> Tioga Terra Cotta | <input type="checkbox"/> Cool Smoke |
| <input type="checkbox"/> Cool Sea Salt | <input type="checkbox"/> Cool Drifting Dunes | <input type="checkbox"/> Cool Saratoga Sunset |
| <input type="checkbox"/> Feathered Driftwood | <input type="checkbox"/> Fresh Cut Cedar | <input type="checkbox"/> Approved Custom Color(s) |

2.03 RELATED MATERIALS

A. Underlayment

1. AquaGuard – a roofing underlayment recognized for use as an alternative to Type 30 roofing underlayment, consisting of spunbonded polyolefin coated with a layer of UV stabilized polyolefin on both sides, meeting requirements of ASTM D2626, referred to as 30 lb. and without perforations.
2. Glacier Guard ice & water underlayment – Granular Surface 100 (55-mil), or Smooth Surface High Temperature 300 (40-mil) a composite membrane consisting of fiberglass-reinforced rubberized asphalt laminated to an impermeable polyethylene film layer (Smooth Surface High Temperature) or coated with a granular surface providing maximum skid resistance (Granular Surface).
3. GAF VersaShield – GAF VersaShield underlayment, (or one of the EcoStar approved alternates for VersaShield listed below) must be installed over the entire deck surface including over the Glacier Guard in conjunction with EcoStar UL Class A Empire Slate tiles for those roof applications requiring UL Class A fire rating. Install Class A underlayment according to the manufacturer’s specifications.

EcoStar approved alternatives to VersaShield include:

- a. Minimum ¼ inch Georgia-Pacific Gypsum, LLC DensDeck mechanically fastened and one ply of Aqua Guard or equivalent, or
- b. MB Technology TU43

B. Fasteners

1. AquaGuard
 - a. Fasteners shall be corrosive-resistant, plastic-capped roofing nails with a minimum plastic cap diameter of 1” (25 mm). Fasteners shall be 90° to the roof deck and shall not be under or over driven.

2. Tile Fasteners

- a. EcoStar ring shank roofing nail with a 3/8" (9.5 mm) diameter head and a minimum of 1-1/2" (38 mm) long shank made from stainless steel. Nails can be supplied either as a hand-drive style or in coils for use in pneumatic tools. The EcoStar ring shank roofing nail is required for fastening of all EcoStar roof tiles.

PART 3 - EXECUTION

3.01 SUBSTRATE CRITERIA

- A. The building owner or owner's representative is responsible for providing and determining that the substrate is suitable to receive the Empire Slate tile roof system and the Authorized EcoStar Gold Star Applicator should not proceed until all defects have been corrected.
- B. The Empire Slate roof system may only be applied over:
 1. Minimum 15/32" (12 mm) plywood or 7/16" (11 mm) OSB decking, properly gapped for expansion.
 2. Minimum 3/4" (19 mm) tongue and groove wood decking with end gaps not exceeding 1/4" (6 mm), and board widths not exceeding 6" (152 mm).
 3. Approved metal deck systems – (Metal deck systems may require the installation of appropriate thickness nail base insulation prior to attaching the EcoStar tiles). Contact EcoStar's technical department for specifics.
 4. Appropriate clearance on underside of decking or sheathing must be provided for proper penetration of the EcoStar fastener.
- C. Minimum slope of substrate for installation of Empire Slate roof systems shall be a minimum of 3/12 (14°) for 6" (152 mm) exposure installation and a minimum of 4/12 (18°) for 7" (178 mm) exposure installation. Contact the EcoStar technical department for approval of applications on lower slopes or exceptions to this requirement.

3.02 SUBSTRATE PREPARATION

- A. The building owner or owner's representative is responsible for ensuring that all wet or damaged substrate has been removed in a re-roofing application.
- B. Existing roof material **MUST** be removed and a clean substrate free of foreign material be provided prior to the installation of the Empire Slate tile roof system. Empire Slate tiles may **NOT** be installed directly over any existing roof material or system.

3.03 INSTALLATION

- A. Flashing & Sheet Metal – Install sheet metal and flashing metal in all valleys and where required. EcoStar recommends a V-type, W-type or Double W-type metal valley flashing be used at all valleys.
- B. Where required, install metal edging at all eaves and roof edges.

- C. EcoStar suggests that all metal work be made from copper or stainless steel. Final choice of metal work is at the discretion of building owner or their designate.
- D. Be aware that staining may occur where runoff from copper metal work comes into contact with the EcoStar tiles. (Example: ridges or cupolas.)
- E. Underlayment
 - 1. Glacier Guard
 - a. Lap end joints 6" (152 mm) and side joints 3.5" (89 mm).
 - b. Apply continuous 36" (914 mm) wide sheet in valley centered over valley.
 - c. Overlap valley metal with a strip of Glacier Guard extending from at least 6" out from the edge of the valley metal to the edge of the tile, or at least 4" inside the edge of the valley metal.
 - d. Apply rows of 36" (914 mm) wide sheets along all eaves and rakes. Lap end joints 6" (152 mm) and side joints 3.5" (89 mm).
 - e. Apply rows of 36" (914 mm) wide sheets along and around all dormers and roof protrusions. Lap end joints 6" (152 mm) and side joints 3.5" (89 mm).
 - f. When applicable install as far up as it can be installed on any head walls or vertical walls a minimum of 12" (305 mm) where possible.
 - g. Do not leave Glacier Guard Granular Surface (100) exposed to weather more than 30 days after beginning of installation. Do not leave Glacier Guard Smooth Surface High Temp (300 black) exposed to the weather more than 60 days after the beginning of installation. Do not leave Glacier Guard Smooth Surface High Temp (300 white) exposed to the weather more than 120 days after the beginning of installation.
 - h. Installation of Glacier Guard at temperatures below 40°F (4°C) may require cap nailing to hold membrane in place while adhesion develops.
 - 2. Aqua Guard
 - a. Apply 48" (1219 mm) wide sheet over complete deck, lapping the area covered with Glacier Guard a minimum of 4" (102").
 - b. Refer to the AquaGuard installation instructions found on the label on each roll. Do not leave exposed to weather more than 180 days after beginning of installation.
 - c. If a ridge vent is required, overlap the ridge slot with the Aqua Guard and fold it back over the last row of field tiles before installation of the ridge vent.
 - 3. GAF VersaShield (or an EcoStar approved alternate)
 - a. GAF VersaShield underlayment (or an EcoStar approved alternate) must be installed over the entire deck surface including over the Glacier Guard in conjunction with EcoStar Class A

Empire Slate tiles for those projects requiring a UL Class A fire rating. GAF VersaShield (or an EcoStar approved alternate) should be installed per manufacturer's specification. Install Class A underlayment according to the manufacturer's specifications. If a ridge vent is required, overlap the ridge slot with the Class A underlayment and fold it back over the last row of field tiles before installation of the ridge vent.

F. Empire Slate Tile Installation

1. After installing underlayment, and before installing the Empire Slate tiles, clean the surface of debris and dirt.
2. All Empire Slate tiles come with shade variation. EcoStar tiles that have been ordered and supplied to the job site under one EcoStar sales order number are blended at the factory and do not need to be blended on site before installation. It is always the responsibility of the applicator to make frequent inspections from the ground or other vantage point to ensure that random shading occurs. EcoStar will not be held responsible for correcting the appearance of non-random installations. Roofers must inspect the roof frequently to prevent customer dissatisfaction.

NOTE: If EcoStar tiles have been supplied to the job site under two or more EcoStar sales order numbers, all tiles must be blended together on site before installation. Specific blending instructions can be found at www.ecostarllc.com on the "Resource Library" page. EcoStar will not be held responsible for correcting the appearance of unblended installations.

Natural weathering will produce further shade variations, even in tiles appearing to be identical in color when new.

3. Minimum Fastening – No less than 2 EcoStar ring shank fasteners per tile shall be used with a minimum length of 1-1/2" (38 mm). Fasteners should be installed at the designated "nail here" marks on the tile. Failure to fasten the tile at these locations may result in a "lifted" tile that will require removal and replacement.
4. CAUTION: When using a pneumatic nailer, care should be taken to ensure that nails are not over driven causing the tiles to curl upward. If tiles have been installed with over driven nails causing the ends of the tile to curve upward, tiles will never lay flat. Overdriven tiles must be removed and re-nailed properly. Never hold the tile from behind while nailing, as this will cause an upward curl of the tile.
5. Do not install tiles against each other. A minimum gap of 3/8" (9.5 mm) must be maintained between installed tiles. A minimum 3/8" (9.5 mm) gap must be maintained between installed tiles and any sidewalls or roof protrusions.
6. It is the responsibility of the Gold Star Authorized Applicator to ensure that each Empire Slate tile has been flexed to provide a downward curve prior to fastening. Do not install tiles with an upward curve.
7. Beginning at the eave, install a row of slate tiles gapped a minimum of 3/8" (9.5 mm) between tiles and any protrusions while achieving a 3/4" (19 mm) overhang. Fasten with two EcoStar ring shank fasteners per tile (in location shown on tiles). This layer of tiles will become the starter row. Care must be taken to make sure that the gaps in the starter row do not line up with the

gaps in the first exposed row of tiles. Maintain at least 2" (51 mm) of gap offset. The final tile at roof edges or penetrations must be a minimum of 3" (76 mm) wide. This may involve cutting the EcoStar tile to fit. To cut the EcoStar tile to the correct width simply score the front of the tile with a straight edge and utility knife and snap tile at that score. It may be quicker and easier to use a power saw. Any power saw with a blade designed to cut wood can be used to cut the tiles. Install the first course of tiles offset to the starter row. The first course of tiles should be installed flush with the starter row with no exposure.

8. Continue installing rows of tiles of random widths up the roof slope at the correct chosen exposure ensuring that bond lines are not placed directly over each other. It is recommended that chalk lines be placed horizontally up the roof slope for every tile course. This will ensure that each course is installed parallel with the roof eave. NEVER use red chalk, as this will permanently stain the EcoStar roof tiles.
 9. Valley Areas – Either an open or closed valley design may be used.
 - a. With an open valley design leave a minimum of 2" (51 mm) on each side of the center of the valley exposed and uncovered by the roof tiles. A V-Style, W-Style, or Double W- Style valley metal may be used.
 - b. With a closed valley design cut the tiles in a straight line to fit no closer than 3/8" (9.5 mm) against tile of adjoining roof slope.
 10. Install Empire Slate Hip & Ridge tiles at all hip locations using a minimum 2" (51 mm) stainless steel ring shank, hand-driven EcoStar fastener. EcoStar recommends a chalk line be snapped up the hip line to ensure a straight application up the roof slope. Empire Slate Hip & Ridge tiles are always installed with a 6" (152 mm) exposure.
 11. Install ridge vent system per the manufacturer's application instructions and then place Empire Slate Hip & Ridge tiles over the ridge vent. A minimum 2-1/2" (64 mm) stainless steel ring shank, hand-driven EcoStar fastener should be used when installing Hip & Ridge tiles to the deck. Place fasteners in the location marked on the tile. Empire Slate Hip & Ridge tiles are always installed with a 6" (152 mm) exposure.
 12. Care must be taken to minimize foot traffic over completed areas of the roof. Empire Slate tiles will show mud and dirt causing appearance problems. The removal of dirt and debris is the responsibility of the applicator. Never use chemical cleaning agents not approved by EcoStar to wash an EcoStar roof assembly.
 13. Empire Slate tiles can be slippery when wet; caution should be exhibited with early morning dew and after rain. EcoStar strongly recommends the use of toe boards and OSHA approved harnesses and safety equipment at all times.
 14. Upon completion of the roof system installation, inspect and remove all debris from roof.
- G. Phased Roofing – The weathering process of the EcoStar tiles will begin immediately upon installation and exposure to the elements. Therefore, every effort should be made to ensure that the EcoStar roof assembly is installed at a continuous rate to completion. Lengthy delays in installation may result in appearance differences when installation is resumed and tiles that have not been exposed to the elements are installed adjacent to tiles that have been on the roof for an extended period of time.