

SECTION 07310

SHINGLES

\*\* NOTE TO SPECIFIER \*\* DaVinci Roofscapes, LLC; polymer resin synthetic slate and shake shingles.
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This section is based on the products of DaVinci Roofscapes, LLC, which is located at:
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Lenexa, KS 66215
Toll Free Tel: 800-DAVINCI
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Web: [www.davinciroofscapes.com](http://www.davinciroofscapes.com)
 [ [Click Here](http://www.arcat.com/arcatcos/cos42/arc42811.html) ] for additional information.
DaVinci Roofscapes, based in Kansas City, Kansas, has been manufacturing award-winning synthetic slate and shake roofing since 1999. DaVinci's revolutionary polymer shingles offer homeowners and contractors the authentic colors and natural textures of quarried slate or rough-hewn cedar shake. They are virtually maintenance free and far more cost effective than the natural product. DaVinci leads the industry in shingle thickness, the widest variety of widths and the greatest variety of subtle earth-tone colors. With state-of-the-art UV stabilizers embedded in the shingle formulation, DaVinci products have inherent superior color fade resistance characteristics. Factory pre-collated blends assure a distinctive look every time, as well as fast, worry free installation, with no special labor, framing or materials required.
We use 100% pure virgin resins in our roof tiles to guarantee a sustainable product. Any materials that fail to meet finished specs are recycled for use in our starter tiles. And of course, every DaVinci tile is 100% recyclable.
DaVinci EcoBlend colors are registered with the Cool Roof Rating Council, and reduce the heat island effect and the temperature of your roof. DaVinci EcoBlend products meet or exceed initial ENERGY STAR® program requirements for 25 percent solar reflectivity and qualify for LEED-NC 7.2 Heat Island Effect. Additionally, all DaVinci products are 100% recyclable.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Synthetic shake shingles, underlayment, flashings, fasteners, and accessories.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 06100 - Rough Carpentry.
		2. Section 07600 - Flashing and Sheet Metal.
		3. Section 07600 - Flashing and Sheet Metal.
		4. Section 07910 - Joint Fillers.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society for Testing and Materials (ASTM):
			1. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
			2. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
			3. ASTM D 3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
			4. ASTM E 108 (UL 790) - Standard Test Methods for Fire Tests of Roof Coverings.
			5. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
		2. Florida Building Code Testing Application Standard (TAS): TAS 125 - Test for Uplift Resistance on Roof Assemblies
		3. Underwriters Laboratories (UL):
			1. UL 790 - (Exterior Exposure), Standard Test Methods for Fire Tests of Roof Coverings.
			2. UL 997 - Wind Resistance of Prepared Roof Covering Materials.
			3. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.
		4. International Code Council (ICC): ES Acceptance Criteria AC07 Section 4.9.
	1. PERFORMANCE REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Delete if shake system not required.

* + 1. Shake roof system to consist of manufactured synthetic shakes attached to structural substrate to form weather tight roof envelope with no measurable water penetration.

\*\* NOTE TO SPECIFIER \*\* Delete if slate system not required.

* + 1. Slate roof system to consist of manufactured synthetic slate shingles attached to structural substrate to form weather tight roof envelope with no measurable water penetration.

\*\* NOTE TO SPECIFIER \*\* Delete if tile system not required.

* + 1. Tiles shall be manufactured with variations in color and size, textured faces and edges, and sufficient thickness to provide a realistic installed appearance.
		2. Method of attachments shall be designed to adequately resist wind uplift for roof configuration and project location. Roof assembly meet minimum uplift resistance of 186 psf or 93 psf with a 2:1 safety patch in accordance with TAS 125.
	1. SUBMITTALS
		1. Submit under provisions of Section 01300 - Administrative Requirements.
		2. Product Data: Manufacturer's data sheets on each product to be used, including:
			1. Shingles, underlayment, flashings, fasteners, and accessories indicating composition, properties, and dimensions. Provide data showing compliance with specified requirements.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Installation methods.
		3. Shop Drawings: Drawings illustrating shingle layout, method of attachment, flashings, trim, conditions at eaves, intersections with adjacent materials, and other installation details.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if shingle color and texture has already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and surface textures.
		2. Verification Samples: For each finish product specified, two samples, representing actual product, color, and texture.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturer of synthetic shingles.
		2. Installer Qualifications: Company specializing in installing shingle roof systems with 3 years minimum experience.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. 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 pattern are approved by Architect.
			3. Rework mock-up area as required to produce acceptable work.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. PRE-INSTALLATION CONFERENCE
		1. Convene a pre-installation conference at the site prior to commencing work of this Section: Require attendance of entities directly concerned with roof installation. Agenda shall include:
			1. Installation procedures and manufacturer's recommendations.
			2. Safety procedures.
			3. Coordination with installation of other work.
			4. Availability of roofing materials.
			5. Preparation and approval of substrate and penetrations through roof.
			6. Other items related to successful execution of work.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Ship in bundles of shingles. Collate shingles in sequence of widths and colors as required for selected color blend. Bundles shall be assembled such that sorting at job site is not required.
		2. Deliver shingles to site in manufacturer's unopened, labeled bundles. Promptly verify quantities and condition. Immediately remove damaged products from site.
		3. Store products in protected environment, clear of ground and moisture, and protected from traffic and construction activities. Store shingles flat. Do not store on site for prolonged period.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Store synthetic shake products at temperature between 40 and 120 degrees F (4 degrees C and 49 degrees C).

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Store synthetic slate products at temperature between 40 and 120 degrees F (4 degrees C and 49 degrees C).
		2. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
	1. PROJECT CONDITIONS
		1. Anticipate and observe environmental conditions (temperature, humidity, and moisture) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
	2. WARRANTY
		1. Warranty Requirements:

\*\* NOTE TO SPECIFIER \*\* DaVinci Roofscapes, LLC will warranty DaVinci Shake and DaVinci Slate synthetic shingles and Bellaforte Roof Tiles against defects in materials and manufacturing for 50 years.

* + - 1. Manufacturer's 50 years warranty for shingles against breakage and deterioration that causes leaks under normal weather and use conditions.

\*\* NOTE TO SPECIFIER \*\* Since the complete roof system includes underlayment, fasteners, flashings, trim, and other components besides synthetic slate shingles, roof warranty against water penetration must be provided by installer rather than shingle manufacturer.

* + - 1. Installer's 2 years total roof system warranty including underlayment, flashings, trim, and other roof components against water penetration.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: DaVinci Roofscapes, LLC, which is located at: 13890 W. 101st St. ; Lenexa, KS 66215; Toll Free Tel: 800-DAVINCI; Tel: 913-599-0766; Fax: 913-599-0065; Email: [request info (mstone@davinciroofscapes.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=DaVinci+Roofscapes,+LLC&coid=42811&rep=&fax=913-599-0065&message=RE:%20Spec%20Question%20(07310drs):%20%20&mf=); Web: [www.davinciroofscapes.com](http://www.davinciroofscapes.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01600 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* DaVinci Shake is a lightweight shake shingle fabricated from polymeric resins that has the appearance of natural wood shakes. Delete if not required.

* + 1. Lightweight, synthetic shake shingles with the appearance, color, texture, and thickness of natural wood shakes.

\*\* NOTE TO SPECIFIER \*\* DaVinci's Fancy Shake roofing shingles provide a cedar look, but with a more refined appearance than a traditional hand-split cedar shingle. Fancy Shake is a pristine shingle, with a clean, smooth look and is available in four DaVinci color blends: Autumn, Mountain, Tahoe and Weathered Gray. Each shingle is 18" long, 7/16" at the butt end and available in 5", 7" and 12" widths. Fancy Shake offers a natural cedar look, but with the traditional durability and ease of installation provided by a synthetic shingle. Delete if not required.

* + - 1. Product: DaVinci Fancy Shake as manufactured by DaVinci Roofscapes, LLC.
			2. Material: Engineered polymer formulated from 100 percent virgin plastic resins. To ensure high quality and consistency of raw materials. Use of recycled materials is not acceptable.
			3. Attributes:
				1. Fire resistant when installed over one layer SOLARHIDE by Eco Chief: Class A tested in accordance with ASTM E 108/UL 790.
				2. Water absorption: 0.18 percent by weight tested in accordance with ASTM D 471.
				3. Impact resistance: Class 4 to withstand two drops of 2 inches (52 mm) diameter, 1.2 pounds (0.54 kg) steel ball dropped from 20 feet (6 m) tested in accordance with UL2218.
				4. Nail pull through resistance: 138 foot-pounds at 72 degree F (187 joules at 22 degrees C) and 166 foot-pounds at 32 degrees F (225 joules at 0 degrees C) tested in accordance with ASTM D 3462.
				5. Freeze-thaw resistance: No crazing, cracking, delamination of coating, or other deleterious surface changes after one month exposure with temperature cycled from -40 to +180 degrees F (0 degrees to 82 degrees C) in 22 hours tested in accordance with International Code Council (ICC) - ES Acceptance Criteria AC07 Section 4.9.
				6. Accelerated weathering: Little change after 2,500 hours exposure to ultraviolet (UV) radiation, elevated temperature, moisture, and thermal shock.
				7. Fungus resistance: No algae growth when inoculated with blue green algae in warm, damp environment for 4 to 6 weeks tested in accordance with ASTM G 21.
				8. Installed weight: At 7 inch (178 mm) Exposure: 304 pounds per square (16.5 kg/sq. m).
			4. Profile: Rectangular shape with exposed to view upper surface and edges textured to resemble natural wood shake. Underside formed with reinforcing ribs for added strength and stability.
			5. Size: Fancy Shake.

\*\* NOTE TO SPECIFIER \*\* DaVinci Fancy Shake shingle is 18" long, 7/16" at the butt end and available in 5", 7" and 12" widths. .

* + - * 1. Thickness: 7/16 inch (11 mm) at butt end.
				2. Length: 18 inches (457 mm).

\*\* NOTE TO SPECIFIER \*\* DaVinci Fancy Shake is manufactured in 3 standard widths to create installed appearance of random sized natural wood shake shingles.

* + - * 1. Variable widths: 5, 7 and 12 inches (127, 178 and 305 mm).
			1. Starter Shingle: Provide 12 inches (305 mm) long by 12 inches (305 mm) wide.
			2. Markings: Form shingles with markings on upper surface to indicate nailing locations and provide alignment guidelines for different exposure lengths.
			3. Color: Provide shingles in multiple colors comparable to natural wood shakes. Provide internal UV stabilizers to provide durable color stability.

\*\* NOTE TO SPECIFIER \*\* DaVinci Roofscapes, LLC provides 4 standard color blends of Fancy Shake. Refer to DaVinci product literature for illustrations. Custom blend single color bundles, and shingle width bundles are available as special orders. Contact DaVinci Roofscapes, LLC for information about special orders. Delete blends not required.

* + - 1. Shingle Pattern: Provide shingles factory blended in multiple colors and widths to create installed appearance designated as follows:
				1. Autumn Blend by DaVinci Roofscapes, LLC.
				2. Chesapeake Blend by DaVinci Roofscapes, LLC.
				3. Mountain Blend by DaVinci Roofscapes, LLC.
				4. Tahoe Blend by DaVinci Roofscapes, LLC.
				5. Weathered Gray Blend by DaVinci Roofscapes, LLC.
				6. Custom Blend as specified by Architect.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. ACCESSORlES

\*\* NOTE TO SPECIFIER \*\* Minimum recommended underlayment for DaVinci Shake is No. 30 asphalt saturated felt. Delete if not required.

* + 1. Underlayment: ASTM D 226 Type II No. 30 un-perforated saturated asphalt felt.

\*\* NOTE TO SPECIFIER \*\* Additional underlayment for DaVinci Shake where a Class A roof assembly is required. Delete if not required.

* + 1. Underlayment: SOLARHIDE by Eco Chief.

\*\* NOTE TO SPECIFIER \*\* In project environments where winter daytime temperatures are below 25 degrees F (-4 degrees C), a waterproof sheet membrane (ice and water shield) is recommended on eaves, valleys, gable ends, and other areas where ice build up is possible. In severe climates, a waterproof sheet membrane can be used as underlayment in lieu of asphalt felt. In all environments, waterproof sheet membrane is recommended in valleys and gable ends. Include and edit the following paragraph if a waterproof sheet membrane is required. Delete if not required.

* + 1. Waterproof Sheet Membrane: Cold applied, self-adhering waterproof membrane composed of polyethylene film coated one side with rubberized asphalt adhesive.
			1. Thickness: 40 mils (1 mm).
			2. Low temperature flexibility: Unaffected at minus 32 degrees F (-36 degrees C).
			3. Minimum tensile strength: 250 psi (1724 kPa).
			4. Minimum elongation: 250 percent.
			5. Permeance: 0.05 perms maximum.

\*\* NOTE TO SPECIFIER \*\* Copper is recommended flashing material although 26 gage galvanized steel can also be used. Delete material not required.

* + 1. Flashing: Fabricate from sheet to profiles and dimensions indicated on Drawings and approved shop drawings and in accordance with general requirements specified in Section 07 60 00 - Flashing and Sheet Metal.
			1. Material: 16 ounce copper.
			2. Material: 26 gage (0.455 mm) galvanized steel.
			3. Linear components: Form in longest possible lengths with 8 feet (2.5 m) as minimum.
			4. Counter Flashings: Extend 4 inches (102 mm) minimum up vertical surfaces and 4 inches (102 mm) minimum under shingles.
			5. Valley flashings: 24 inches minimum width and extending 10 inches (254 mm) minimum from valley center line.
			6. Fabricate eave flashings with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

\*\* NOTE TO SPECIFIER \*\* DaVinci Roofscapes, LLC recommends copper nails be used to attach shingles. Acceptable alternatives are stainless steel and hot-dipped galvanized nails. Delete material not required.

* + 1. Fasteners: 3/8 inch (9.5 mm) flat head nails 1-1/2 inches (38 mm) long.
			1. Material: Copper.
			2. Material: Stainless steel.
			3. Material: Hot-dipped galvanized.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph if gutters and downspouts are used to drain roof. Delete if not required.

* + 1. Coordinate installation with provision of gutters and downspouts specified in Section 07 60 00 - Flashing and Sheet Metal.

\*\* NOTE TO SPECIFIER \*\* DaVinci Shake is typically installed over a solid wood substrate. Acceptable materials are 15/32 inch (12 mm) thick plywood or 7/16 inch (11 mm) oriented strand board (OSB).

* + 1. Inspect roof framing and plywood or OSB substrate. Verify roof is complete, rigid, braced, and deck members are securely fastened. Ensure proper ventilation has been provided for roof space. Do not proceed with roofing until deficiencies are addressed.
		2. Verify roof deck is clean, dry, and ready to receive synthetic shake shingles.
		3. Remove dirt, loose fasteners, and other protrusions from roof surface.
	1. INSTALLATION - GENERAL

\*\* NOTE TO SPECIFIER \*\* See Manufacturer's issues section for underlayment installation in Florida.

* + 1. Install self-adhered waterproof sheet membrane on the eaves. Cover the waterproof sheet membrane and the remaining portions of the roof as scheduled with the approved underlayment(s). Then install waterproof sheet membrane in valleys, along walls and around projections terminating on top of underlayment.
	1. UNDERLAYMENT INSTALLATION

\*\* NOTE TO SPECIFIER \*\* DaVinci Roofscapes, LLC requires that the roof area be stripped in with self-adhered waterproof sheet membrane. Felt underlayment must still be used in addition to self-adhered waterproof sheet membrane. Delete if not required.

* + 1. Stripping Ply: A full sheet of self-adhered waterproof sheet membrane is required in all valleys. At least 18 inches (457 mm) shall be required on all gable ends, against walls, and around projections.
			1. In areas where the average daily temperature in January is 25 degrees F (-4 degrees C) or lower or where ice buildup is possible, install self-adhered waterproof sheet membrane from the bottom edge extending two feet (610 mm) above the exterior wall line on all eaves.

\*\* NOTE TO SPECIFIER \*\* DaVinci Roofscapes, LLC requires that asphalt felt underlayment be used on all roof slopes. For roof slopes below 4 in 12, DaVinci Roofscapes, LLC requires that a additional ply of waterproof sheet membrane be used. Include the following paragraph if waterproof sheet membrane underlayment is being installed over full roof area. Felt underlayment must still be used in addition to ice and water shield. Delete if not required.

* + 1. Install waterproof sheet membrane over full roof area. Apply waterproof sheet membrane in fair weather at temperatures of 40 degrees F (4 degrees C) or higher. Adhere and attach as recommended by manufacturer of waterproof sheet membrane.
			1. Start underlayment installation at lower edge of roof. Install perpendicular to roof slope with 4 inches (102 mm) minimum side laps and 6 inches (152 mm) minimum end laps. Extend underlayment 4 inches (102 mm) minimum up vertical wall intersections.
			2. Do not leave underlayment membrane exposed for lengthy period of time. Exercise care not to puncture or tear underlayment barrier with subsequent roofing operations.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph if asphalt felt is being used as the complete underlayment or if it is being installed in combination with waterproof sheet membrane. Delete if not required.

* + 1. Underlayment/Slip Sheet: Install one-ply asphalt felt over full roof area, with ends weather lapped 4 inches (102 mm) minimum. Nail in place with roofing nails spaced in accordance with manufacturer's recommendations.

\*\* NOTE TO SPECIFIER \*\* DaVinci Roofscapes, LLC requires the following underlayment on the BellaforteShake to achieve Class A and Class C roof covering. Delete if not required.

* 1. FIRE RESISTIVE ROOF COVERING

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Class A tested in accordance with ASTM E 108: Provide one layer SOLARHIDE by Eco Chief.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Class C tested in accordance with ASTM E 108: provide one layer 30 lb felt that meets ASTM D 226 Type II standard or a listed synthetic underlayment.
	1. FLASHING INSTALLATION
		1. Install overhanging drip edge on eaves and gable ends and metal flashings at valleys, ridges, hips, roof curbs, penetrations, and intersections with vertical surfaces in accordance with Section 07 60 00 - Flashing and Sheet Metal.
		2. Weather lap joints 2 inches (52 mm) minimum and seal with sealant as specified in Section 07 91 26 - Joint Fillers.
		3. Secure in place with clips, nails, or other fasteners.
	2. INSTALLATION - GENERAL
		1. Install synthetic shingles in accordance with manufacturer's instructions and approved shop drawings.
		2. Accurately layout shingles. Ensure that edges are parallel and perpendicular to roof eaves.
		3. Cutting: Layout work to avoid cutting shingles.
			1. At gables and vertical intersections, vary combination of shingle widths and spacing of shingles to avoid cutting.
			2. If cutting is required, place shingle such that cut edge is not exposed.
			3. Use circular saw or straight edge and utility knife if cuts are necessary.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. SHAKE SHINGLE INSTALLATION
		1. Install shingles in a rack or pyramid style from factory assembled bundles.

\*\* NOTE TO SPECIFIER \*\* There are two methods of installation, straight and staggered. Delete exposure not required.

* + 1. Exposure: Install shingles in straight pattern with 10 inches (254 mm) exposure and bottom shingle edges evenly aligned.
		2. Exposure: Install shingles in staggered pattern with 9 inches (229 mm) exposure and bottom edges of adjacent shingles staggered 1 inch (25 mm).
		3. Spacing: Provide 3/16 - 3/8 inch (4.76 - 9.5 mm) gap between shingles to allow for expansion and contraction.
		4. Stagger shingle joints in one course 1-1/2 inches (38 mm) minimum from joints in course below.
		5. Eaves: Install row of starter shingles at eaves as base layer. Project eave shingles approximately 1 inch (25 mm) , 1/8 inch (3 mm) past overhanging drip edge, or as required to allow water to drain into gutter or off eave as indicated or required.
		6. Gables: Project shingles approximately 3/4 inch beyond gable rakes or 1/8 inch (3 mm) past overhanging drip edge.
		7. Ridges and Hips: After field shingle installation is complete, install double row of shingles over 6 inches (152 mm) wide metal flashing.
			1. Ridges: Use 6 inches (152 mm) wide shingles with 10 inches (254 mm) exposure. Start ridge shingles at leeward end. Face shingle laps away from prevailing wind.
			2. Hips: Use 6 inches (152 mm) wide shingles with 10 inches (254 mm) exposure. Start hip course at eave.
		8. Fastening: Attach each shingle to wood deck with 2 nails using hammer or pneumatic nail gun.
			1. Place nails at locations indicated on shingles.
			2. Ensure good penetration but do not overdrive nail. Do not nail at angle. Ensure head is flush with shingle surface to avoid creating craters.
			3. At valleys do not nail shingles within 5 inches (127 mm) of valley center line.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. FIELD QUALITY CONTROL
		1. Inspect units as they are installed. Do not install cracked, broken, twisted, curled, or otherwise damaged units.
		2. As work progresses, exercise care not to scratch or mar installed units. Units damaged during installation shall be immediately removed and discarded.
		3. After approximately 200 units have been installed, inspect roof from ground. Verify proper layout and appearance. Repeat inspection every 200 shingles.
		4. Visually inspect complete installation to ensure that it is weather tight.
	2. CLEANING AND PROTECTION
		1. Remove excess materials and debris from finished surfaces and adjacent roof areas.
		2. Do not allow work force on completed roof.
		3. Protect installed products until completion of project.
		4. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION