Section 07310 – Slate Shingles

1.1 QUALIFICATIONS

The Contractor shall provide qualified workers, trained and experienced in installing slate roofing systems of this configuration, and shall submit documentation of 3 years of work of this type. The Contractor shall be familiar with and shall perform work in accordance with NRCA 0405. A list of installations made shall be provided, identifying when, where, and for whom the installations were made.

1.2 DELIVERY, STORAGE AND HANDLING

Materials shall be delivered in manufacturer's unopened bundles and containers with the manufacturer's brand and name marked clearly thereon. Shingles shall be stored in accordance with manufacturer's printed instructions. Roll goods shall be stored on end in an upright position. Immediately before laying, roofing felt shall be stored for 24 hours in an area maintained at a temperature not lower than 10 degrees C 50 degrees F.

1.3 PROJECT/SITE CONDITIONS

1.3.1 Environmental Requirements

Slate roofing work shall proceed when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.

1.3.2 Material Storage

Materials shall not be stored on roof decks in such a manner as to overstress and/or damage the deck and supporting structure. Placing of loads at midspans of framing shall be avoided. Superimposed loads shall be well distributed.

1.3.3 Units of Work

Units of work shall be established, including removal of existing materials, preparation of existing surfaces and application of underlayment and nailers, and related temporary and/or permanent flashing so that the unit of work can be completed prior to the end of each working day.

1.3.4 Temporary Protection Materials

Materials shall be provided and maintained on the site at all times for temporary roofing, flashing, and other protection when delays and/or changed weather conditions do not permit completion of each unit of work prior to the end of each working day. Materials which have been used for temporary roofing, flashing and other protection shall be removed and discarded.

1.3.5 Drawings

The Contactor shall submit drawings as specified in the Submittals paragraph, under SD-02.

1.4 WARRANTY

A warranty shall be furnished against defects in material and workmanship of slate roof assembly, including related metal flashing for a period of 10 years from date of final acceptance of the work.

2.1 MATERIALS

(Edit these paragraphs to meet project requirements. Most common techniques are in blue)

2.1.1 Existing Slate (ONLY if existing slate is to be reused)

Intact and serviceable existing slate materials shall be salvaged and reused whenever possible. New slate being incorporated into existing slate roofs shall match existing as closely as possible..

2.1.2 Slate

Slate shall conform to ASTM C 406. Slate shall be Grade A, (ASTM S1), hard, dense rock, punched or drilled for two nails each. Cracked slate shall not be used. Exposed corners shall be full. Broken corners on covered ends which sacrifice nailing strength or the laying of a watertight roof will not be allowed.

2.1.2.1 Standard Thickness Roofing Slate

Slate shall be [[smooth texture] [rough texture]] in Standard ¼ inch thickness. Slate shall be the [[_____] by [_____] Constant Width] or [(16", 18", 20",24" ____ Length in random widths] [graduated lengths]. Contact Black Diamond Slate LLC (877-229-9277) for standard size availability. Optional thickness slate may be 3/8 to ½ inch and ½ to ¾ inch.

2.1.2.2 Graduated Roof Slate (ONLY if graduated sizes are to be used)

Slate shall be [[smooth texture] [rough texture]] and shall vary in thickness from [_____] at eave to [_____] at ridge; the percentage of each thickness to be respectively [_____]. The thicknesses shall be intermingled in the various courses, modulating from the heavier and thicker slates in the lower courses of the roof to the thinner slates at the ridge. Slate shall be in standard random widths graduated in length from [_____] at eave to [_____] at ridge, and shall be applied with standard 75 mm 3 inch lap and exposures.

2.1.2.3 Slate Colors

Slate shall be unfading and non-weathering in nature. Color shall be [Black, Dark Gray, Light Gray, Green, Gray/Green, Purple, Red, or equivalent to existing slate]. Contact Black Diamond Slate LLC (877-229-9277) for sample submittals.

2.1.2.4 Approved Supplier

The slate shall be provided by Black Diamond Slate LLC, Savannah, GA (877) 229-9277 or (912) 898-2301. www.blackdiamondslate.com

2.1.3 Underlayment Membrane

An underlayment membrane shall be furnished on all surfaces to be covered with slate. Membrane shall consist of [asphalt-saturated felt] [or] [high strength composite self-adhering membrane].

2.1.3.1 Roofing Felt

Roofing felt shall be asphalt-saturated rag felt, Type II, No. 30 asphalt felt in accordance with ASTM D 226.

2.1.3.2 Elastomeric Membrane Underlayment

Membrane shall be a cold applied composite self-adhering membrane of not less than 0.10 mm 0.004 inch high strength polyethylene film with slip resistant embossing, coated on one side with a thick layer of adhesive-consistency rubberized asphalt, interwound with a disposable silicone coated release sheet. The tensile strength and elongation values shall be not less than 1.7 MPa 250 psi when tested in accordance with ASTM D 412 and pliability shall be unaffected when tested in accordance with ASTM D 146.

2.1.3.3 Elastomeric Membrane Accessories

Two component urethane, mastic and primer shall be as approved by the membrane manufacturer. Flashing, expansion joint covers, temporary UV protection and corner fillets shall be as recommended by the membrane manufacturer.

2.1.4 Nails

Nails shall be large-headed slater's solid copper nails of Number 10 or 11 gauge metal. Nails shall be 3d for slates 450 mm 18 inch or less in length; 4d nails shall be used for slates 500 mm 20 inch or longer, and 6d nails shall be used for slates on hips and ridges. Thicker slates require longer and heavier gauge nails. The proper size shall be determined by adding 25 mm 1 inch to twice the thickness of the slate. Nails shall be of sufficient length to adequately penetrate the roof sheathing. Nails used to retain copper flashing and slate at rake edges, hips, ridges, and eaves prone to wind damage shall be of the ring shank design.

2.1.5 Flashing

Flashing shall be 0.57 kg 20 ounce, light cold-rolled temper (H00) copper conforming to ASTM B 370. Flashing shall be in accordance with the requirements as specified in Section 07600 FLASHING AND SHEET METAL.

2.1.6 Elastic Cement

Elastic cement shall be an approved brand of waterproof elastic slater's cement colored to match as nearly as possible the general color of the slate.

2.1.7 Acid Neutralizing Wash (ONLY if existing areas of slate are to be cleaned and left in service)

Acid neutralizing wash shall be non-destructive wash formulated to neutralize the effects of acid deposits resulting from the past burning of fossil fuels (particularly coal). The wash shall not change the color, appearance, or life of the slate roof, copper flashing and accessories, underlayment, adhesives or the wall surfaces of the building.

2.1.8 Sealants

Sealants, where required, shall be in accordance with the slate manufacturer's recommendations.

3.1 PROTECTION OF ROOF SURFACES

Equipment (such as padded ridge ladders) and techniques shall be used which prevent damage to roof as a result of foot or material traffic. Contractor shall be responsible for controlling breakage of new or existing slate beyond what is indicated. The progression of work shall be laid out and presented to the Contracting Officer to prevent other trades from working on or above completed roofing. Personnel who are working on the roof shall have proper shoes which will not further damage slates, and shoe soles shall be made of a material which will aid in preventing falls.

3.2 SLATE REMOVAL (ONLY where work involves partial replacement or repair of roof)

Contractor shall verify each slate for tightness and continued use. Testing shall be done with broad, flat-nosed, slater's pliers. Slates fastened with non-copper fasteners shall be re-fastened with proper copper fasteners.

3.3 PREPARATION OF SURFACES

Roof deck surfaces shall be smooth, clean, firm, dry, and free from loose boards, large cracks, and projecting ends that might damage the roofing. Foreign particles shall be cleaned from interlocking areas to ensure proper seating and to prevent water damming. Prior to installation of slate, vents and other projections through roofs shall be properly flashed and secured in position, and projecting nails shall be driven firmly home.

3.4 ROOFING FELT

Felt shall be laid in horizontal layers with joints lapped toward eaves and at ends at least 50 mm 2 inches, and secured along laps and at ends as necessary to hold the felt in place and protect the structure until covered with the slate. Felt shall be preserved unbroken, tight and whole. Felt shall lap hips and ridges at least 300 mm 12 inches to form a double thickness and shall be lapped 50 mm 2 inches over the metal of valleys or built-in gutters.

3.5 ELASTOMERIC MEMBRANE UNDERLAYMENT (A composite self-adhering membrane will be used in areas where ice build-up (ice dams) and wind driven rains are potential problems. In such areas, underlayment installation will be detailed on the drawings. Edit these paragraphs to meet project requirements.)

3.5.1 Surface Preparation

Dust, dirt, loose nails or other protrusions shall be removed. Priming is not required for wood or metal surfaces but is necessary on concrete or masonry surfaces.

3.5.2 Primer

Primer shall be applied at a coverage rate of 6-9 sq. meters/L 250-350 sq. ft./gal. Primer shall be applied by spray or paint roller. Pine wood decks shall be covered with minimum 6 mm 1/4 inch plywood prior to receiving membrane coverage.

3.5.3 Temperature

Membrane shall be applied only in fair weather when air and surface temperatures are above 5 degrees C 40 degrees F.

3.5.4 Membrane Application

Membrane shall be applied according to manufacturer's instructions. Membrane shall be adhered directly to roof deck. The membrane shall be cut into 3 to 4.5 meter 10 to 15 foot lengths and shall be re-rolled. The release paper shall be peeled back 300 to 600 mm; 1 to 2 feet; the membrane shall be aligned on the lower edge of the roof and the first 300 to 600 mm 1 to 2 feet shall be placed. The release paper under the membrane shall be peeled from the membrane. The membrane shall be pressed in place. Lower edges shall be rolled firmly with a wallpaper or hand roller. For ice dam protection, membrane shall be applied to reach a point above the highest expected level of ice dams; refer to drawings for extent. Ends and edges shall be overlapped a minimum of 150 mm 6 inches. Membrane shall not be folded onto an exposed face of the roof edge.

3.5.5 Valley and Ridge Application

The membrane shall be cut into 1.2 to 1.8 meter 4 to 6 foot lengths. The release paper sheet shall be peeled and centered over the valley or ridge, then draped and pressed in place, working from the center of the valley or ridge outward in each direction. For valleys, membrane shall be applied starting at the low point and working upwards. All sheets shall be overlapped a minimum of 150 mm 6 inches.

3.5.6 Vertical Membrane Flashings

Vertical wall installations shall receive primer prior to the application of membrane. Primer shall be applied at a coverage rate of 6-9 sq. meters/L 250-350 sq. ft./gal. Membrane shall be turned up walls and dormers as indicated on the drawings. Vertical membrane terminations shall be mechanically fastened. Vertical terminations shall receive a troweling of mastic as approved by the membrane manufacturer. Membrane may be folded onto the fascia, provided it will be covered by a gutter metal edge or other material.

3.5.7 Protection

Elastomeric membrane underlayment shall not be left permanently exposed to sunlight. Membrane shall be covered with exposed roofing materials as soon as possible. Membrane damaged due to exposure to sunlight shall be patched prior to the application of final roof covering.

3.6 METAL FLASHING

Metal flashing shall be as shown at intersections of vertical or projecting surfaces through the roof or against which the roof abuts, such as walls, parapets, dormers, and sides of chimneys. Flashing installation shall be in accordance with Section 07600 FLASHING AND SHEET METAL.

3.7 SLATING

3.7.1 Repair and Replacement

Existing reusable slates removed from the repair area shall be intermingled with new slates to provide a smooth visual transition between new and existing areas. Slating shall be applied as shown.

3.7.2 Slate Coursing

The slate shall project 50 mm 2 inches at the eaves and 25 mm 1 inch at gable ends, and shall be laid in horizontal courses with 75 mm 3 inch headlap (unless otherwise indicated), and each course shall break joints with the preceding one by at least 75 mm 3 inches. Slates at the eaves or cornice line shall be doubled and canted 6 mm 1/4 inch by a wooden cant strip, using same thickness slate for under-eaves at first exposed course. Under-eave slate shall be approximately 75 mm 3 inches longer than exposure of first course. There shall be no through joints from the roof surface to the underlayment.

3.7.3 Nailing

Each slate shall be fastened with a minimum of two copper nails of sufficient length to penetrate the roof decking at least 19 mm 3/4 inch or through the decking thickness, whichever is less. Where the underside of roof decking is exposed to view, such as in overhanging eaves, the nails shall be long enough to penetrate the roof decking but not so long that they may be driven through the decking. The heads of slating nails shall just touch the slate and shall not be driven "home" or draw the slate, but left with the heads just clearing the slate so that the slate hangs on the nail. Nails in slates overlapping sheet metalwork shall not puncture the sheet metal. Exposed nails are permissible only in top courses where unavoidable. Exposed nail heads shall be covered with elastic cement. Hip slates and ridge slates shall be laid in elastic cement spread thickly over unexposed surface of under courses of slate, nailed securely in place and pointed with elastic cement.

3.7.4 Vertical Surfaces

Slate shall be fitted neatly around pipes, ventilators, chimneys and other vertical surfaces.

3.7.5 Hips

Hips shall be laid to form a [saddle] [fantail] [mitered] [Boston] hip as shown.

3.7.6 Ridges

Ridges shall be laid to form [saddle] [comb] [strip saddle] ridges. The nails of the combing slate shall pass through the joints of the slate below. The combing slate shall be laid with the same exposure as the next course down.

3.7.7 Valleys

Valleys shall be laid to form [open] [closed] [round] valleys.

3.8 ACCESSORIES FOR SLATE ROOFS

3.8.1 Crickets or Saddles

Vertical surfaces which project through the roof surface at a right angle to the slope of the roof shall have a cricket (sometimes referred to as a saddle) built into the roof to divert water away from the back of the vertical member, as shown. Crickets of light rafter construction covered with sheathing, underlayment, and copper sheet metal specified in Section 07600 FLASHING AND SHEET METAL. If the cricket area is large and exposed to view, it shall be slated the same as other roof areas. Open-type valleys shall be formed with the main roof at cricket areas. The size of the cricket is largely determined by the roof condition. Unless noted otherwise, the slope of the cricket shall be the same as the slope of the roof.

END OF SECTION