EXHIBIT 19

U.S. General Services Administration

Specifications for Slate Shingles

CSI Division:
Division 7 - Thermal and Moisture Protection
Section:
Slate Shingles
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Rewrite
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PREFACE: This procedure should be used in conjunction with "Re-Roofing Using Slate Shingles"

PART 1–GENERAL

1.01 CHARACTERISTICS OF SLATE

A. Slate is a natural stone and can produce a wide range of effects based on its appearance, color, thickness, surface texture, and roof texture.
    1. A permanent material that is waterproof, fireproof, resistant to climatic changes, and requires no preservative coatings or paint, and no cleaning, resulting in lower insurance premiums, higher property values, little or no maintenance costs, and a high salvage value.
    2. Some slates have a greater porosity than others and will eventually begin to spall due to freeze-thaw cycles.

3. The quality and characteristics of various slate types vary greatly among the various quarry sources. Slate types that are rated as ASTM S-1 are considered the best quality.

Reference: National Slate Association

1.02 CAUSES FOR ROOF FAILURE

A. Failure of a slate roof is generally due to poor installation methods.
   1. Nails that are driven too far may cause tension in the tightly held slate resulting in cracking of individual units.
   2. Nails not driven quite far enough may cause the slate in the course above to rest unevenly on the protruding nail head. This makes the slates more susceptible to breaking if stepped upon.
   3. The use of inappropriate nails can lead to failure such as rusting. If some slates are letting go because their nails have rusted through, all the slates may eventually have to be re-laid with the proper copper nails.
   4. If shingle nails rather than large, flat-head wire nails are used, individual slates can easily slip off of the nails.
B. Leaks in slate roofs can also be caused by deteriorated flashings. Flashings gradually erode due to scouring of rain water running down valleys. Atmospheric conditions can also cause flashings to corrode.
C. To a lesser extent, slate roofs can fail due to the deterioration of the slates themselves. If the majority of the slates are delaminating or crumbling due to atmospheric conditions reacting with the mineral content of the slates, it is impossible to save the roof.

1.03 DEFINITIONS

A. Butt - the exposed end of a roofing slate.
B. Clear - in regions where slate contains bands of rock compositionally different from the main body of slate “clear” denotes slates which have been trimmed of all such ribbons.
C. Commercial Standard Slate - most common and available roofing slate. Exact definition varies by region, but generally this slate is 3/16” thick with varying widths (8” to 14”) and a length between 18” and 24”. Each slate has a bevelled edge and pre-punched nail holes. Quality is fairly consistent.
D. Comb Ridge - ridge finishing treatment in which the combing slates on the north or east side are laid extending 116” to 1” over the other side. The grain of the combing slates may be either vertical or horizontal.
E. Cox Comb Ridge - the combing slates (those projecting at the top) alternately projecting on either side of the ridge.
F. Curb - the line formed by the junction of two different slopes on one side of a roof—especially on Mansard and Gambrel roofs.
G. Exposure - the length of each slate exposed to the weather, i.e., not covered by the next above course. Exposure is expressed in inches. A simple formula is used to compute the exposure: Deduct 3” (standard lap) from length of slate and divide by two. For a 24” slate, usual exposure is 24-3= 21, 21 divided by 2=10-1/2”.
H. Freaks - slates having an unusual combination or variation of color, bought for special effects on special order. They are thicker than usual—never split under 1/4” and up to 2” or more.
I. Graduated roof - variation on the Standard slate roof described below. Slates are arranged so that the thickest and longest are at the eaves, diminishing in size and thickness to the ridges. Usually this is combined with other generally more labor-intensive treatments such as closed valleys.
J. Lap (headlap) - that part of a slate overlaying the slate two courses below. The standard lap is 3”. Roofs with less slope (flatter) often take a 4” lap; those very steep need only a 2” lap.
K. Ribbon Stock - slate which contains bands of rock differing in composition and color from the main body of stone. It is always labelled as such. Usually from Pennsylvania quarries.
L. Saddle Ridge - finish in which the regular roofing slate are extended to the ridge line so that slates on both sides of roof are butted flush. Then another course of slates is laid with its grain horizontal (combing slates)and lapped horizontally to cover the previous combing slate’s nail holes. They are butted flush on either side of the ridge.

M. Standard Roof - one composed of Commercial Standard Slate n(approx. 3/16 in. thick) of more-or-less uniform standard width and length, with butts laid to a line, in standard slate colors. (No color patterns, no freaks.) Encompasses those slates with butts (exposed ends) trimmed to have an hexagonal, diamond, or Gothic pattern.

N. Square - number of slates needed to cover 100 square feet of plain roof surface, when laid with the customary lap of 3". (Roofs with a flatter slope require only a 4" lap, so more slates are need to cover 100 sq. ft.; very steep roofs take a 2" lap, so fewer slates are needed per square.) Commercial Standard Slate weighs 650-750 lbs. per normal square.

O. Textural Roof - in between a Standard roof and a Graduated roof. Generally, such a roof has more visual interest than the Standard, with use of rough slates instead of smooth, or with unevenly laid butts, or variations in the thickness, size, and color of slates. (Not usually over 3/8" thick.)

P. Unfading - a color designation given to those slates that do not "weather" appreciably or change color over the years. (As Unfading Red.)

Q. Weathering - the exposed surface of a shingle, or a modifying word describing the color characteristic of a slate. Weathering slates react chemically with the atmosphere to gradually change hue over the years; does not affect longevity or hardness of the slate. See Unfading.

1.04 SYSTEM DESCRIPTION

A. Slate quarried for roofing stock is of dense, sound, rock, exceedingly tough and durable. \
   1. Slate, like any other stone, becomes harder and tougher upon exposure than when first quarried, and is practically non-absorbent.
   2. Many slates split to a smooth, practically even and uniform surface, while others are somewhat rough and uneven.

B. The color of slate is determined by its chemical and mineralogical composition and may be obtained in a variety of colors and shades.
   1. Grey, Blue Grey, Purple, Mottled Purple and Green, Green, and Red.
   2. These color designations should be preceded by the word "unfading" or "weathering," according to the ultimate color effect that may be desired.

C. There are several grades and types of slate, but the most commonly specified is the Commercial Standard slate, which has the following properties:
   1. Surface: Reasonably smooth straight cleavage full length of slate both front and back. The maximum bend should not exceed 1/4" in lengths up to 16", not exceed 3/8" in lengths from 16" to 24".
   2. Texture: Should be free from knots or knurls that in any way interfere with the safe conveyance or the laying of the slate on the roof.
   3. Corners: Reasonably full corners on exposed ends. No broken corners on covered ends that would sacrifice nailing strength, or the laying of a water tight slate roof.
   4. Weight: 600 to 750 lbs. per square, depending on type, color, and quarry. Allow 8 lbs. per square foot dead load for combined weight of slates, nails, and felt.
   5. Thickness: Approximately 3/16".

ART 2–PRODUCTS

2.01 MANUFACTURERS

A. Slate shingles:
   1. Buckingham-Slate Corporation
      (Blue-black. High quality Virginia slate sold through distributors. Free literature)
   2. Evergreen Slate Co.
      (Gray-green, purple, green mottled green-purple, gray black, unfading red, Vermont black. Vermont & New York slate sold direct. Also slater's tools. Free brochure)

3. Hilltop Slate Co.
   (Gray-green, purple, green, mottled green-purple, gray-black, gray, Vermont black. New York and Vermont Slate sold direct and through distributors. Free brochure)
4. Midland Engineering Co.
   (A major distributor for roofing products including German clay tiles and Vermont slate, sold through roofers and direct. Free brochures on all products - specify your interest)
5. Vermont Slate Company Mr. Slate
6. Penn Big Bed Slate Co.
   (Gray black)
7. Monson Maine Slate Co.
   (Unfading black slate, only on special order)
8. Rising and Nelson Slate Co.
   (Green, gray, Vermont black, and gray-black, purple, mottled green-purple, red. Vermont slate is not sold direct. Free brochure)
9. Shelton Slate Products Co.
   (All typical New York-Vermont colors)
10. Structural Slate Co.
    (Pennsylvania slate sold through distributors. Free brochure)
11. Vermont Structural Slate Co.
    (Green, gray Vermont black, gray-black, purple, mottled green-purple, red. Vermont roofing slate sold direct and through distributors. Free brochure)

B. Slate roofing substitutes
1. Monier Group
   (Concrete tiles designed to imitate terra cotta, wood, and slate tiles are sold through distributors. Free literature)
2. Vande Hey Raleigh
   (Manufactures a broad line of extruded concrete roofing tiles, including a simulated slate and a Mission tile. Also has a large stock of recycled slate, concrete, and clay tiles)

C. Slating tools:
1. Stortz & Son

2.02 MATERIAL PERFORMANCE REQUIREMENTS

A. Slate: Natural slate roofing units used for replacement should duplicate existing slate installed on the roof and match for thickness, color and texture, as well as type, size and existing, and should be punched for nailing. It should be noted that slate is always sold by the”square”, or 100 sq. ft. of roof laid with a 3” head lap NOTE: THE FOLLOWING INFORMATION SHOULD BE SUPPLIED TO THE ROOFING CONTRACTOR WHEN DETERMINING QUANTITIES AND COSTS.
1. Kind and color of slate.
2. Size of slate desired, stating length and “all one width” or random width.
3. Thickness, as “commercial standard,” 1/4”, 3/8”, etc.
4. Type of roof, as standard, textural, graduated or flat.
5. Kind of nails, as zinc clad, zinc, “yellow metal”, copper clad, or copper.
6. Kind of valleys and flashings.
7. If hip or gable roof.
8. Kind of snow guards, as galvanized, yellow metal or copper.
9. If snow rails, size of pipe and number of rows of pipe.
10. Location of job; if in city or vicinity, or out of city.
11. When job is to be finished.

B. Nails:

1. All nails, rivets, and similar fastenings, if any, used throughout the work should be of best grade hard copper.
2. Nails should be large flat-head copper wire nails. DO NOT USE COPPER ROOFING NAILS OR ORDINARY COPPER WIRE NAILS.
3. Nail length should be twice the thickness of the slates plus 1". Minimum length is 7/8". Sizes: 3d for commercial standard slates up to 18" in length; 4d for slates over 18"; 6d for ridge and hip slates.

C. Flashings:

1. All intersections of roofs with vertical surfaces of every kind and all openings in roof surfaces, should be properly flashed.
2. Match appearance of original materials. If any existing flashings are to be reused, new material must be the same as the original material to prevent galvanic corrosion.
    a. Copper - 16-oz. soft copper; occasionally 20-oz. required, consult manufacturer.
    b. Lead - 2-1/2# to 3#.
    c. Terne - 20# or 40# depending on type of flashing, i.e cap and base flashing, 20# or vertical and horizontal surfaces, 40#. Consult manufacturer.
    d. Galvanized - 24 ga. to 26 ga. depending o type of flashing, consult manufacturer.

D. Base flashings:

1. Should be at least 4" high.
2. Should project at least 4" out onto the roof.
3. Should be a full 96" in length. On sloping roofs they should lap longitudinally at least 3".

E. Reglets:

1. Flashings should finish in reglets in the masonry.
2. The flashing should be turned into the reglet the full depth and should be turned back to form a hook. After the flashing is in place the reglet should be filled caulked, using molten lead on flat surfaces, and lead wool on vertical surfaces. After caulking the reglet should be made smooth by filling with elastic cement.

F. Step flashings:

1. Step flashings should be used where vertical surfaces occur in connection with slopes.
2. They should be formed of separate pieces built into the masonry as specified for cap flashings in masonry.
3. Steps should generally be 3", but should in no case be less than 2", and should not be soldered. Lap joints should be vertical.

G. Vent flashings:

1. All pipes passing through roofs should be flashed and counter flashed.
2. Base flashings should extend out on the roof not less than 6". They should be of sufficient length to cover the slate course next below the pipe and to extend up under the slate course above as far as possible without puncture by nails.

H. Open valley flashings:

1. Open valleys should be not less than 4" wide.
   NOTE: To determine the proper width for flashing, start at the top with a width of 4", increase the width one inch for every 8 feet of length of the valley. Flashing pieces should be full length sheets and of sufficient width to cover the open portion of the valley and extend up under the slate not less than 4" on each side.
2. Where two valleys of unequal size come together, or where the areas drained by the valley are unequal, there should be placed in the valley a "crimp" angle or tee not less than 1" high. This "crimp" may be formed in the valley sheet before placing, or it may be made of a separate piece soldered to the valley sheet.

I. Closed valley flashings:

1. Flashing pieces, for closed valley should be of sufficient length to extend 2" above the top of slate roofing piece and lap the flashing piece below 3", and of width sufficient to extend up the sides of the valley far enough to make the valley inches deep.

2. They should be placed with the slate so that all pieces are separated by a course of slate. Pieces should be set so as to lap at least 3” and to be entirely concealed by the slates. They should be fastened by the nails at the top edge only.

J. Elastic cement or exterior grade caulk such as “Gutter- Seal” (Dow), “Roof Sealant” (Alcoa), or approved equal.

1. A sticky, waterproof compound used to secure hip and ridge slates.
2. It has a high melting point and low freezing point.

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