

EXHIBIT 20



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U.S. General Services Administration

Minor Repairs To Slate Roofs

CSI Division:

Division 7 - Thermal and Moisture Protection

Section:

Slate Shingles

Last Modified:

07/03/2017

Disclaimer

Technical Procedures Disclaimer

Prior to inclusion in GSA's library of procedures, documents are reviewed by one or more qualified preservation specialists for general consistency with the Secretary of Interior Standards for rehabilitating historic buildings as understood at the time the procedure is added to the library. All specifications require project-specific editing and professional judgement regarding the applicability of a procedure to a particular building, project or location. References to products and suppliers are to serve as a general guideline and do not constitute a federal endorsement or determination that a product or method is the best or most current alternative, remains available, or is compliant with current environmental regulations and safety standards. The library of procedures is intended to serve as a resource, not a substitute, for specification development by a qualified preservation professional.

Rewrite

We've reviewed these procedures for general consistency with federal standards for rehabilitating historic buildings and provide them only as a reference. Specifications should only be applied under the guidance of a qualified preservation professional who can assess the applicability of a procedure to a particular building, project or location. References to products and suppliers serve as general guidelines and do not constitute a federal endorsement nor a determination that a product or method is the best alternative or compliant with current environmental regulations and safety standards.

PART I-GENERAL

1.01 SUMMARY

A. This procedure includes guidance on replacing individual cracked or broken slate shingles, and re-hanging loose shingles.

NOTE: THIS WORK SHOULD BE PERFORMED BY AN EXPERIENCED ROOFING CONTRACTOR WITH EXPERTISE IN WORKING WITH SLATE.

B. If 20% of roof requires repair, complete replacement should be considered.

C. See also procedure 07315-02-S for general information concerning slate. See 07315-04-S for supplemental guidelines for repairing and replacing slate roofs.

D. See 01100-07-S for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Safety Precautions
2. Historic Structures Precautions
3. Submittals
4. Quality Assurance
5. Delivery, Storage and Handling
6. Project/Site Conditions
7. Sequencing and Scheduling
8. General Protection (Surface and Surrounding)

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO).

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM) www.astm.org

1.03 SUBMITTALS

A. Samples:

1. Submit nails proposed for use to the RHPO for approval.
2. Submit slate shingles proposed for use to the RHPO for approval.

1.04 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Maintain the weathertightness of the roof during repair operations.
2. Protect adjacent shingles from damage during examination and repair of shingles. DO NOT walk on slate shingles.

PART 2-PRODUCTS

2.01 MATERIALS

A. Slate Shingles:

1. Provide new slate shingles hand-cleft from sound stone, meeting Federal Specification, 55-5-451, Grade A, maximum water absorption (ASTM C121) of .1%. Color and appearance shall match existing as closely as possible.

2. Thickness: 3/16 inch nominal thickness, or to match existing; thickness to be within the tolerances of minus 0 inches and plus 1/8 inch.

3. Shingle Size: To match existing.

B. Nails: Provide large head hard copper wire nails

1. Wood deck: (Length of nail equals twice the thickness of the slate plus 1"). 3d nails for standard slates up to 18 inches long; 4d nails for extra long slates; 6d nails for ridge and hip slates.

2. Concrete Deck: 1-1/2 inch length, 10 gauge suitable for driving into nailing concrete.

C. Roofer's Cement: ASTM D-282. Non-staining and non-corrosive.

D. Copper Sheetting: Provide 16 ounce soft, rolled copper to match existing flashing (i.e. lead-coated copper, stainless steel, etc.)

2.02 EQUIPMENT

A. Slate cutter

B. Slate ripper

C. Slate hammer

PART 3-EXECUTION

3.01 EXAMINATION

A. Inspect the conditions under which the work is to be carried out. Inspect the condition of the roof deck to which the slate shingles will be applied. Report any unsatisfactory conditions to the RHPO. DO NOT walk on slates during examination.

3.02 ERECTION, INSTALLATION, APPLICATION

A. Removal of Existing Loose or Damaged Shingles:

1. Using a slate ripper, carefully remove any loose, cracked and broken slate shingles from the roof, taking care not to break those that are only loose. Remove any remaining small pieces of slate.

2. Store removed full slate shingles for reuse, to the extent desired by the Contracting Officer on the job site where directed.

B. Acceptance of Roof Deck: Inspect roof deck for flaws which could prevent the proper installation of the new slates. Report any defects to the Contracting Officer in writing.

C. Replacement of Slate Roofing (method one):

1. Slide in new slates to replace broken, missing or cracked slates. Reuse existing full slates wherever possible.

2. Line up slate in its course making sure any pre-punched holes are covered by the slates above.

3. Neatly fit the slate around all pipes, vents and other penetrations.

4. Mark location of new nail hole through the vertical joint of slates in the overlying course, approximately 5 inches from the head of the overlaying slate or 2 inches below the tail of the second course of slate above.

5. Punch or drill new hole and nail slate into position using copper nails as specified. Cut nail head as required to fit between slates in overlaying courses. Nail shall not be driven so far as to put strain on the slates; slate should hang from the nail.

6. Slates overlapping sheet metal shall have the nails so placed as to avoid puncturing the sheet metal.

7. Cut a piece of copper approximately 3 inches wide by 8 inches long. Cut edge slightly to help with friction fit. Bend piece slightly lengthwise to make it concave or convex which will insure its remaining tightly in place. Insert the piece of copper lengthwise over the slating nail and under the course above so that it extends approximately two inches under the succeeding course and completely covers the new nail hole.

D. Alternative method: THIS METHOD SHOULD NOT BE USED IN NORTHERN CLIMATES WHERE SNOW AND ICE COULD CAUSE TAB TO UNBEND.

1. Remove damaged slate as directed above.
2. Cut a copper tab approximately 1 inch wide by 8 inches long. Double over bottom 4 inches and bend up to form an "L" shape.
3. Nail top of tab to roof deck using a copper nail. Daub nail head with non-corrosive, non-staining elastic roofing cement.
4. Slide replacement slate into place so that bottom of slate rests on copper tab. Bend doubled portion of tab up and over the bottom of the slate to hold it in place. Approximately 1 inch of the tab should be visible.

3.03 ADJUSTING/CLEANING

- A. Clean work areas of all debris as roofing work progresses. At conclusion of job, clean up loose slates, containers and nails and leave job site neat and clean.

Last updated: Aug 13, 2017