Slate Roofs

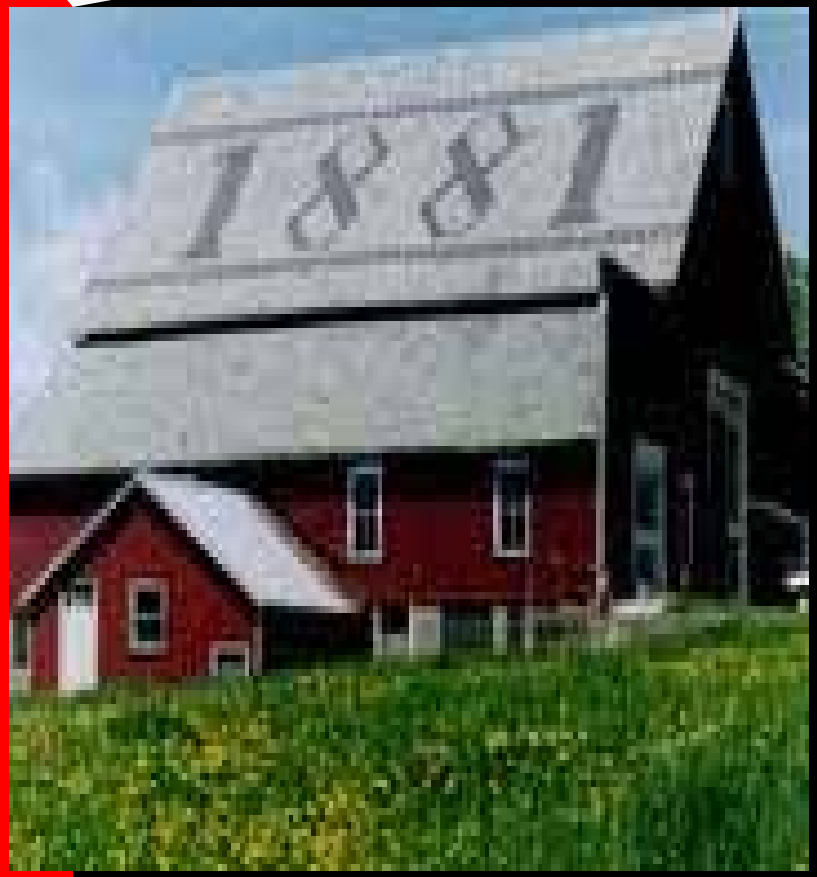
DCAMM Office of Facility Management & Maintenance

An informational presentation for the repair, replacement and maintenance of slate roofs.

Slate Roofs

- Slate Roofs are a critical design feature of many historic buildings that cannot be duplicated using substitute materials.
- Slate roofs can, and should be, maintained and repaired to effectively extend their serviceable lives.
- Installed properly, slate roofs require relatively little maintenance and will last 60 to 125 years or longer depending on the type of slate, roof configuration and geographical location.

Slate Roofs



- The life span of slate “generally” depends on where the slate was quarried.
- Vermont and New York slates last about 125 years.
- Buckingham Virginia slates last 175 years or more.
- Pennsylvania SoftVein slates last in excess of 60 years.
- Pennsylvania HardVein and Peach Bottom slates are no longer quarried but had life spans of 100 & 200 years respectively.

Deterioration of Slate Roofs

- The natural weathering of roof slate manifests itself as a slow process of chipping and scaling.
- The slate becomes soft and spongy as the inner layers delaminate.
- High-grade slate will emit a clear solid sound when tapped, severely weathered slate will give off a dull thud.
- The weathering of slate is chiefly due to mineral impurities which form gypsum.This material causes the slate to flake .

Deterioration of Slate Roofs

- This gypsum can be observed as white blotches leaching out on the surface of slate.
- The pitch of the roof can also effect its longevity. The steeper the pitch, the longer the slate can be expected to last.
- Areas of a roof subject to concentrated water flows and ice damming, such as along eaves and valleys tend to deteriorate more rapidly than other roof areas.

Deterioration of Slate Roofs

- The tendency of old, weathered slates to absorb and hold moisture can lead to rot in underlying area of woodsheathing.
- Delamination and flaking are just as bad or worse on the underside of slate as on the exposed surface. This is why most slates cannot be flipped over for reuse.
- Non-ferrous Slater's nails should always be used in installing slate. The rusting of 19th century cut nails is a common cause of slate loss.

Repairing Slate Roofs

- Broken, cracked, and missing slates should be repaired promptly by an experienced Slater in order to prevent water damage to interior finishes, accelerated deterioration of the roof and roof sheathing, and possible structural degradation to framing members.
- When many slates must be removed to effect a repair, the sheathing should be checked for rotted areas and projecting nails.

Repairing Slate Roofs

- In an emergency situation, a temporary roof covering should be installed.
- Heavy gauge plastic or vinyl tarpaulins can be used, however, roll roofing, carefully stitched in to areas of the remaining roof, is a somewhat more functional solution that will allow sufficient time to document the existing roof conditions, plan repairs, and order materials.

Replacement of Deteriorated Roofs

- Historic Slate Roofs should be repaired rather than replaced whenever possible. To help decide which way to go:
- 1. Consider the age and condition of the roof versus its expected serviceable life given the type of slate employed.
- 2. Calculate the number of damaged or missing slates. Is the number less than 20%? Is the roof generally in good condition?
- 3. Are there active leaks? Gutters, valleys and flashings are more likely candidates for leaks than the slates themselves. False leaks can be caused by moisture condensation in the attic due to improper ventilation.
- 4. Check the roof rafters and sheathing for moisture stains and rotten wood.
- 5. Press down hard on the slates with your hand. Deteriorated slates will feel brittle and crack. Tap on removed slates for sound quality. A dull thud is bad, a full deep sound is good.

Replacement of Deteriorated Roofs

- A roof and its associated flashings, gutters and downspouts function as a system to shed water.
- Use a single type of metal for all flashings, gutters and downspouts to avoid galvanic action.
- Choose materials with life spans comparable to that of slate such as nonferrous nails.
- Because flashings are the weakest point in any roof, use the most durable of metals and the best workmanship for installing flashings.
- Copper is the best flashing material, followed by terne or terne coated stainless steel.

Slate Roof Maintenance

- Given the relatively high initial cost of installing a new slate roof, it pays to inspect its overall condition annually and after several storms.
- For safety reasons, it is recommended that maintenance personnel carry out roof surveys from the ground using binoculars or from a cherry picker.

Slate Roof Maintenance

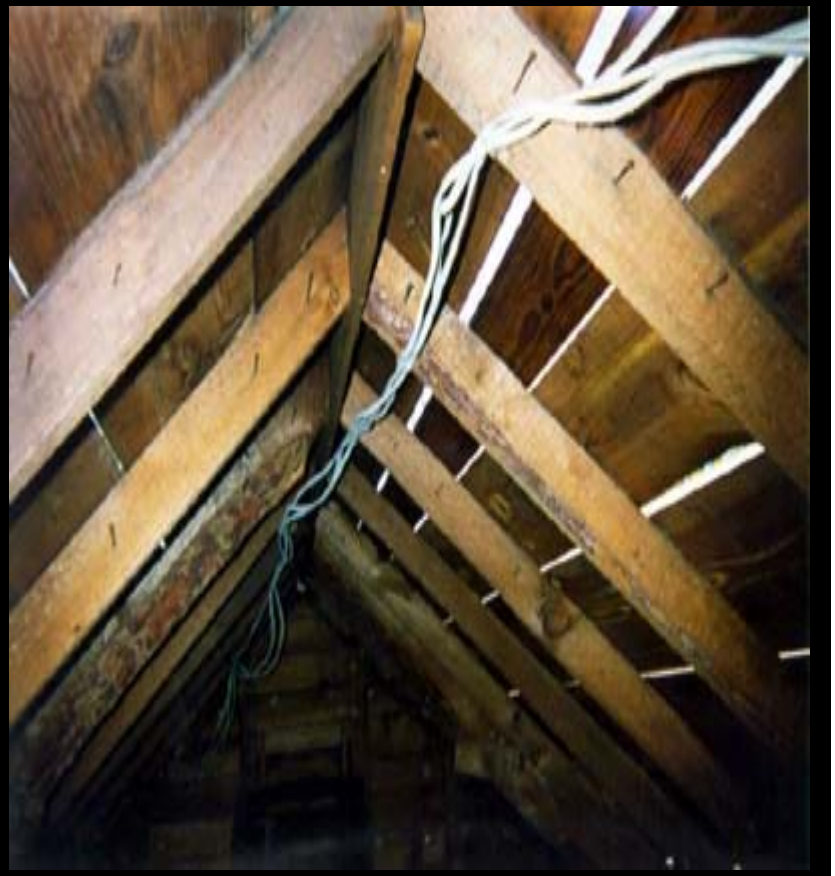
- Cracked, broken, misarranged, and missing slates and the degree to which delamination has occurred should be noted.

Slate Roof Maintenance

- Also take note of deteriorating flashings and broken or clogged downspouts.
- A roof plan or sketch and a camera can aid in recording problems.

Slate Roof Maintenance

- In the attic, wood rafters and sheathing should be checked for water stains and rot.
- Critical areas are typically near the roof plate and at valleys and hips.



Slate Roof Maintenance

- Regular maintenance should include cleaning gutters at least twice during the fall and once in early spring .
- Damaged slates should be replaced promptly.
- Every five to seven years inspections should be conducted by professionals experienced in working with slate and steep slopes.

Slate Roof Maintenance

- A good record keeping system and the systematic filing of all bills and samples will document the roof's repair history and will be an important part of your slate roof maintenance program.

Slate Roof Maintenance

- Please remember! DCAM can assist you in loading your slate roof preventative maintenance activities and work orders into CAMIS, your Capital Asset Management Information System

Slate Roof Maintenance

- As part of regular maintenance, an attempt should be made to keep foot traffic off the roof.
- If maintenance personnel must walk on the roof, hook ladders over the ridge and have workmen walk on the ladders to better distribute their weight.
- If walking on slates, wear soft soled shoes and walk on the lower middle of the exposed portion of the slate unit.

Acknowledgements

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