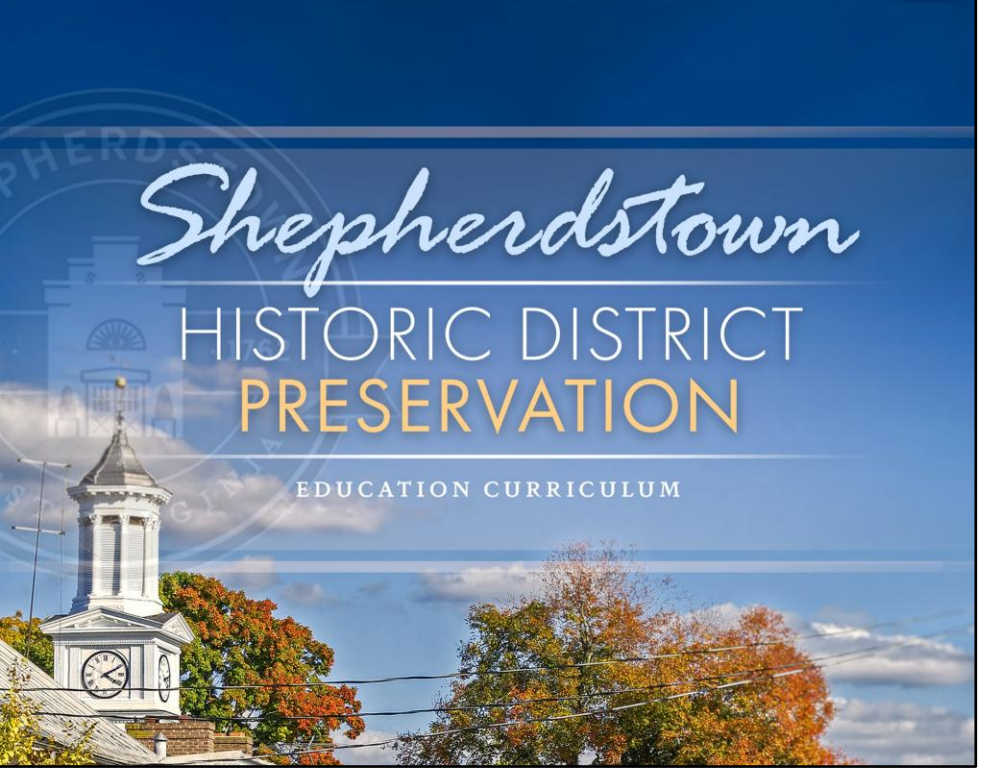


Shepherdstown Window Preservation Education

HISTORIC WOOD WINDOW MAINTENANCE

The History of Wood Windows in Shepherdstown

From the founding of Shepherdstown through the 1930s, if a building had windows, they were made of crafted wood assemblies with individual panes of cylinder, sheet, or plate glass.

Shepherdstown has a legacy of wood windows

Historic windows are essential to preserving a building’s architectural integrity and Shepherdstown’s cultural identity. They are not just functional elements but character-defining features that contribute to a built environment’s aesthetic, historical significance, and sense of place. When building owners replace historic wood windows with modern units, this compromises the original design, proportions, and craftsmanship, diminishing the building’s authenticity and eroding the town’s character one sash at a time.

The windows are the eyes of the building, and the eyes are the window to the soul. Preserving historic windows is essential to preserving Shepherdstown's sense of place.

Restoration of Wood Windows on Historic Buildings

In addition to saving Shepherdstown's sense of place, restoration is typically more cost-effective and durable. Historic wood windows, when properly maintained, can last 100 years or more, whereas replacement windows typically need replacing every 20–30 years.

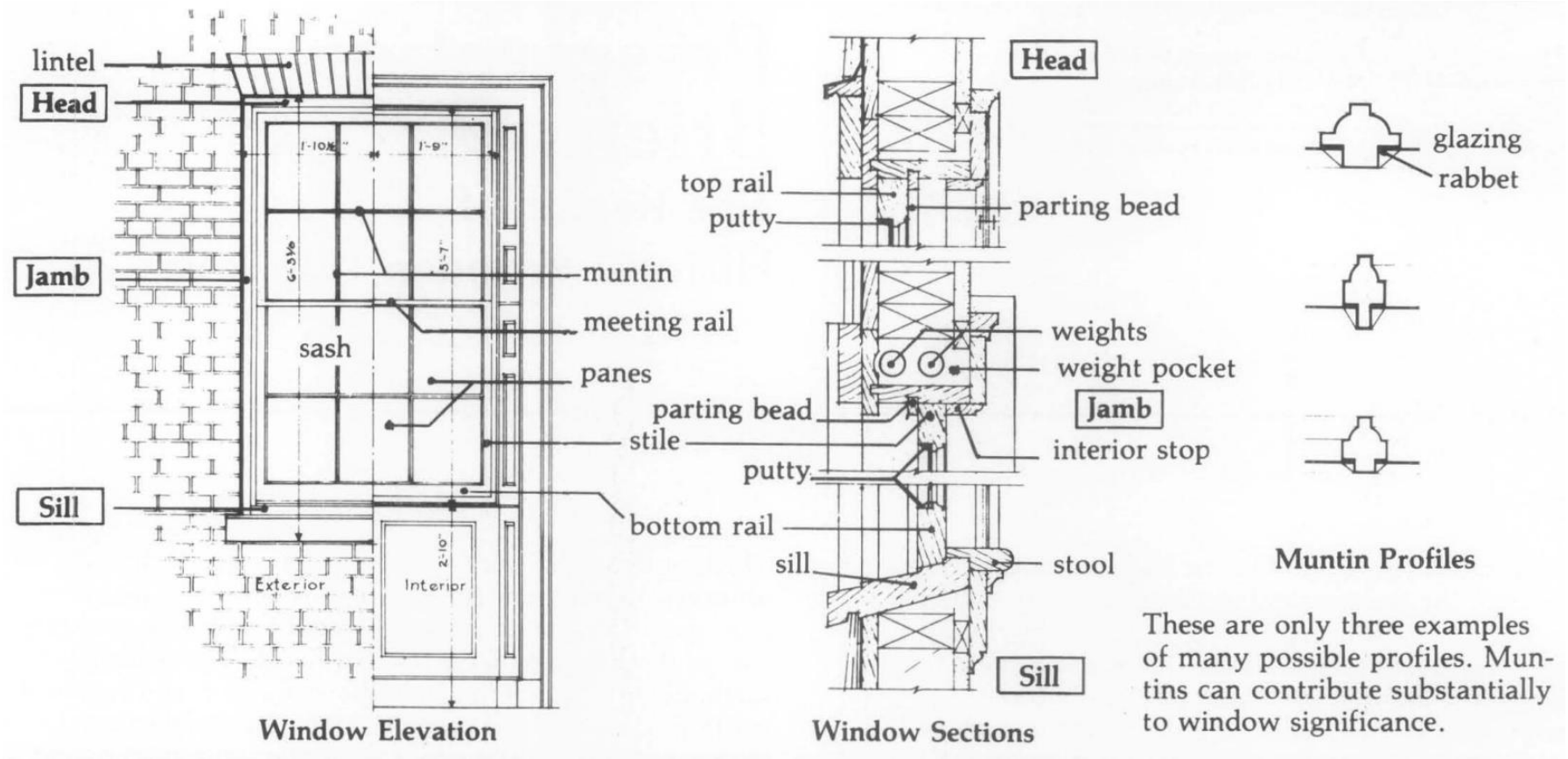
Sustainability efforts benefit from restoration in that avoiding replacement means keeping valuable materials out of landfills and not creating additional carbon.

Adding storm windows, weatherstripping, and sealing can make restored historic windows as energy-efficient as new premium ones—often at a fraction of the cost.

Furthermore, repair work on historic windows supports keeping living heritage skills alive.

Living heritage refers to the transmission of traditional, hands-on skills—like those used in historic wood window restoration—through apprenticeships and formal training programs. These skills include mastering tools, materials, and methods for repairing wood windows, siding, and framing from pre-1960 construction.

Historic Window Components



Preservation Briefs: 9
The Repair of Historic Wooden Windows

John H. Myers

Enemy of Wood Windows Everywhere: Wood Rot

Wood rot is the natural breakdown of the wood's fibers caused by fungi. This breakdown occurs in areas with prolonged and repeated exposure to moisture. Historic windows—especially those painted shut and or poorly maintained—are particularly vulnerable to this rot

The Two Fungus Types That Cause Wood Rot:

Brown Rot – Common in windows, makes wood crumbly, clumpy, and dark like chunks of tree bark

White Rot – Slower, but leaves wood spongy, pale, and fibrous, like a stringy cornstalk texture

Both thrive in wet, warm conditions. Seasonal temperature swings break up the seal of paint, allowing water to migrate into the wooden windowsills, bottom rails, and meeting rails, where the rot then breaks them down quickly.

Proper preventative maintenance routines, such as painting and sealing, protect windows from wood rot infiltration and spread, thereby prolonging the life of the wood windows.

Inappropriate Windows on Historic Buildings

Loss of Historical Character: Historic windows are custom-built and often unique in size, shape, proportion, and detail. Replacing them with standard or modern windows—especially vinyl or aluminum—can flatten the architectural appearance, disrupt and distract from the building's proportions, and slowly erode the building's historic sense of place.

Aesthetic and Craftsmanship Issues: Modern replacements often use utilitarian profiles, flat muntins, and faux applied grids that lack the depth, shadow lines, and craftsmanship of the building's original windows. This results in a less authentic, visually inferior appearance that looks cheap and fake.

Inappropriate Windows on Historic Buildings

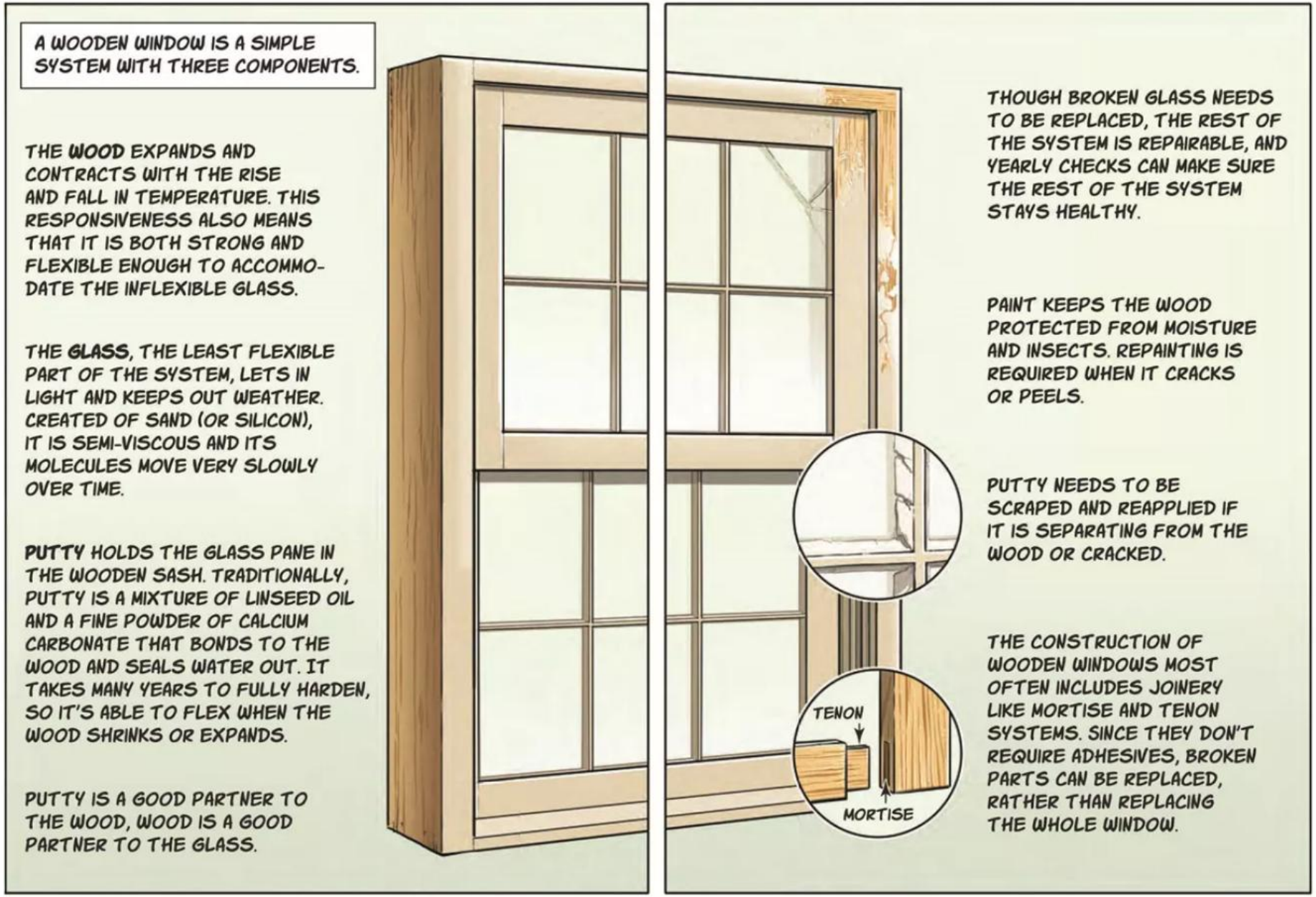
Environmental and Economic Waste: Historic windows contain high embodied energy from **old-growth wood** and long manufacturing processes. Replacing them wastes this energy and generates additional waste. Studies show it can take 40 to 220 years to recoup the energy savings from new windows, while modern windows often fail within 15–25 years, making replacement a poor long-term investment.
(See study from Community Preservation.org)

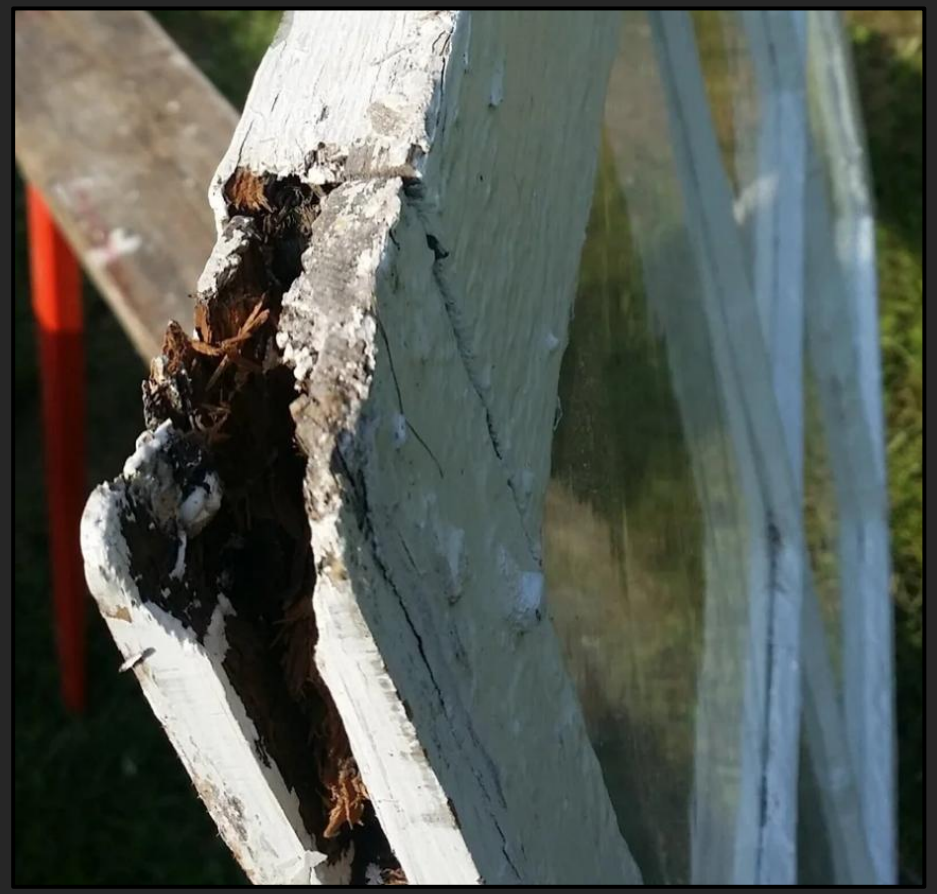
Inferior Performance and Durability: Despite common belief, well-maintained historic windows with interior storm windows perform nearly as well as modern double-glazed units. In contrast, modern windows are not repairable—once they fail, they must be replaced entirely. Historic windows, however, can be repaired, reglazed, and repainted indefinitely.

https://www.communitypreservation.org/sites/g/files/vyhlif4646/f/uploads/windowenergyanalysis.pdf

Window Component Function Diagram

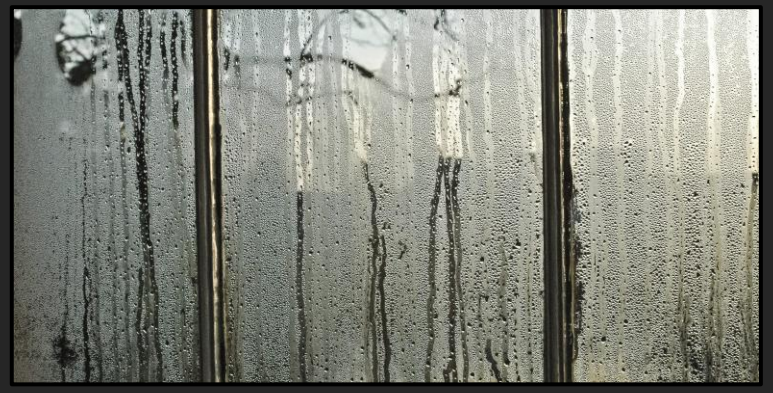
SOURCE: ANDREA SAVONTY, SAVONTY RESTORATION; NATIONAL CENTER FOR PRESERVATION TECHNOLOGY AND TRAINING





Recognizing the Signs that it's Time for Intervention

- **Signs of failing historic wood windows include:**
- **Sticking or drafty operation:** Difficulty opening, closing, or locking windows, often due to warped sashes, damaged hardware, or failed weatherstripping.
- **Visible rot or decay:** Look for crumbly brown wood (brown rot) or spongy pale wood (white rot), especially in bottom rails, windowsills, jamb bottoms, and glazing putty edges.
- **Peeling, bubbling, or cracked paint:** Indicates moisture intrusion and potential hidden rot beneath the surface.
- **Soft or mushy spots:** Gently probe wood with a screwdriver; if it sinks easily, rot is likely present.



Recognizing the Signs that it's Time for Intervention

- **Musty odor**: A sign of fungal growth and moisture buildup behind the wood.
- **Water stains, leaks, or mold:** Water seeping through windows can lead to rot, structural damage, and mold growth.
- **Warped or misaligned frames:** Can compromise structural integrity and cause gaps that lead to drafts.
- **Condensation between panes:** Indicates a failed seal in double-paned windows, reducing energy efficiency.
- **Increased energy bills:** A sign that the windows are no longer providing adequate insulation.

Repair Class I: Routine Maintenance

Maintenance is essentially the provision of continuous care to preserve the windows' heritage and character effectively. Maintenance activities may include routine and periodic inspections, cleaning, minor repairs, and refinishing operations, designed to preserve the existing form and substance of the building from neglect and decay.

Repair Class II: Stabilization

Stabilization efforts are undertaken when portions of the wood window require intervention to prevent material destruction or material compromise.

Partially decayed wood can be waterproofed, patched, built-up, or consolidated and then painted to achieve a stable condition, seamless appearance, and extended life.

One established technique for repairing wood that is splitting, cracking, or showing signs of rot is to:

1) Dry the wood.

2) Treat decayed areas with a fungicide.

3) Waterproof with two or three applications of boiled linseed oil.

4) Fill in all cracks and holes with putty.

5) After a good sealing layer of putty forms, paint the surface.

Repair Class III: Splices and Parts Replacement

Wood windows that have been left without maintenance for too long will likely require the introduction of new materials to offset deterioration. These new materials can be spliced and matched into existing historic members.

The techniques require more skill and are more expensive than any of the previously discussed alternatives. It is necessary to remove the sash and the affected parts of the frame and have the historic carpenter reproduce the damaged and missing parts. Most millwork firms can duplicate parts, such as muntins, bottom rails, or sills, which can then be incorporated back into the existing window and thus maintain as much integrity as possible.

Weatherization

Any historic wood window that is maintained or repaired should be made as energy efficient as possible. The proper installation of appropriate weatherstripping reduces air infiltration.

Rolled vinyl strips may be tacked into place in appropriate locations to reduce air and temperature infiltration.

Metal strips or plastic spring strips may be used on the rails and, sometimes, in the channels between the sash and jamb.

Appropriate contemporary weatherstripping should be considered an integral part of the repair process for windows.

The use of sash locks installed on the meeting rail can also ensure that the sash is kept tightly closed for more effective weatherstripping.

Intentionality in finding historically sympathetic locks is not easy, but it will make an impressive addition to the look and feel of the window.

Replacement

Replacement windows should be seen as a last resort and should seek to perfectly replicate the existing historic windows, re-using historic glass whenever possible. This option is also the most cost-restrictive, as most historic windows were original to the building and are constructed of custom parts and pieces, which require extensive hours of labor to recreate perfectly.

Historic Paint Analysis Provides Data

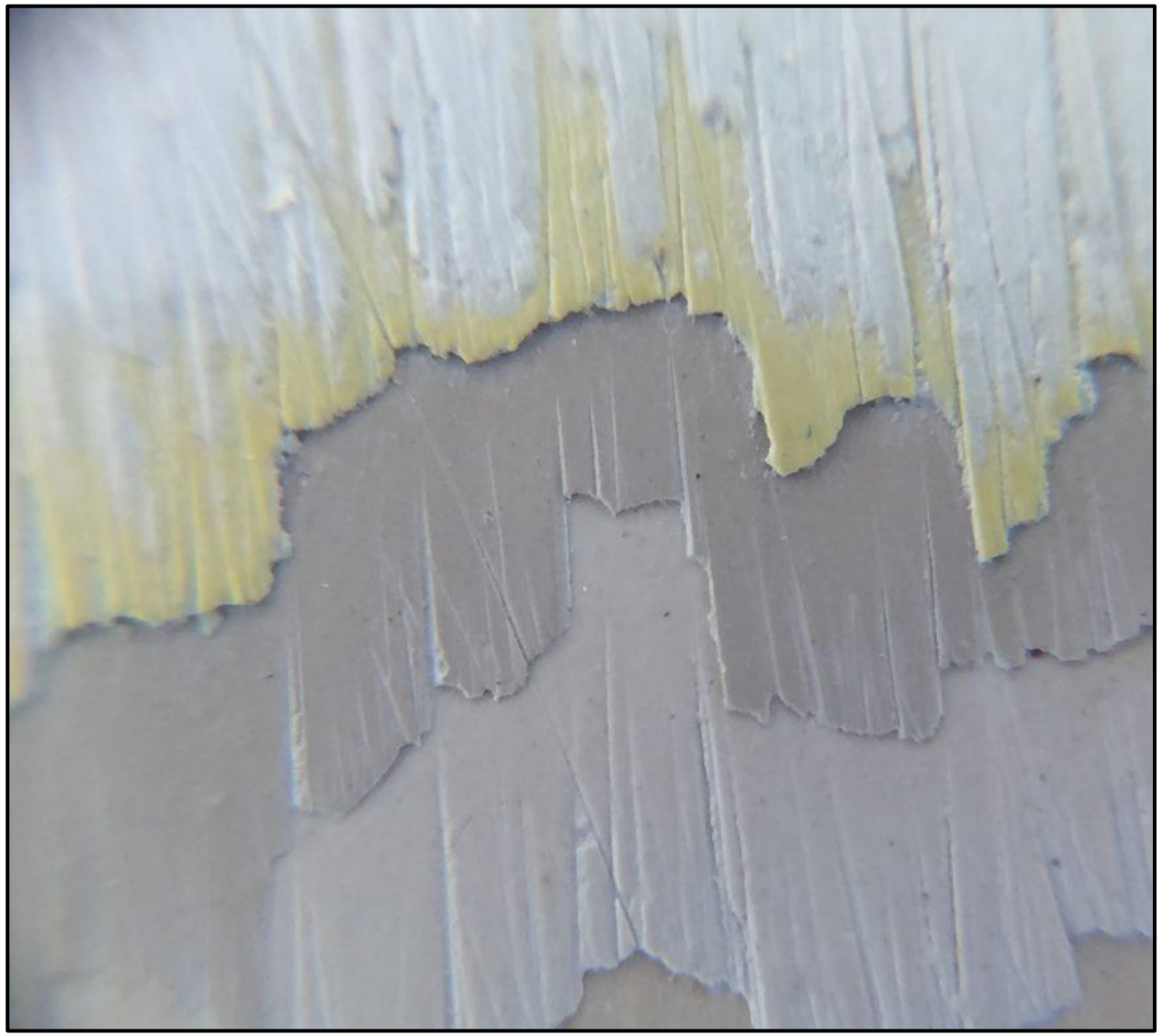
Accurate Color Palette: Identification of original and significant paint colors, often matched to modern systems for restoration.

Chronological History: A "paint diary" that outlines how the building's appearance has changed over time.

Material Analysis: Identification of the type of paint used (e.g., oil, latex, acrylic, whitewash) to determine proper, compatible materials for restoration and maintenance.

Documented Findings Report: A detailed report, crucial for restoration projects, which includes stratigraphic data, evidence of repairs, and often, documentation required for historic tax credits or preservation grants.

Risk Reduction: Identification of hidden hazards, such as lead paint, which is often found in older layers.

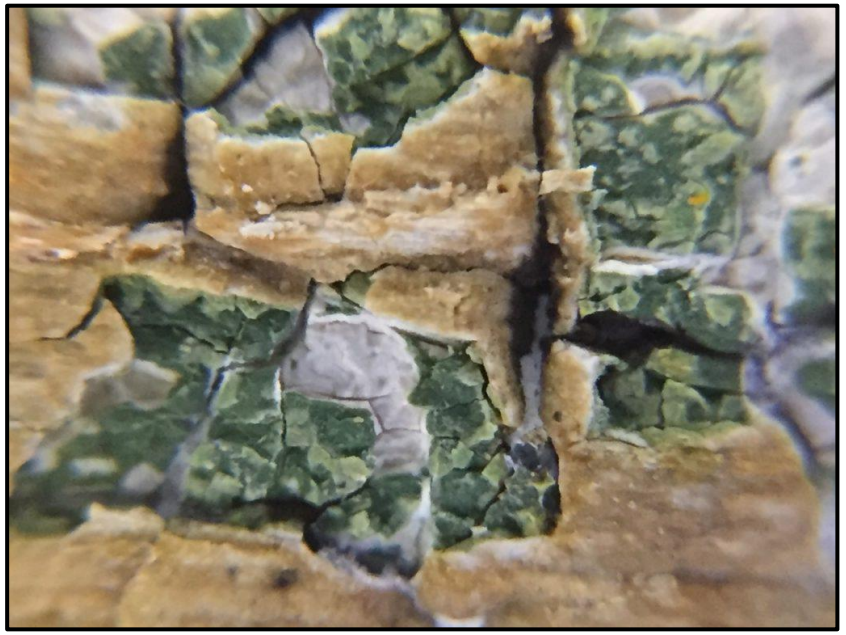


Lead Paint Survey & Discovery

Testing and Assessment: Before any restoration, test for lead paint using a certified test kit **or hire a professional**.

This is critical because **all wood windows built before 1978 are highly likely to contain lead-based paint**.

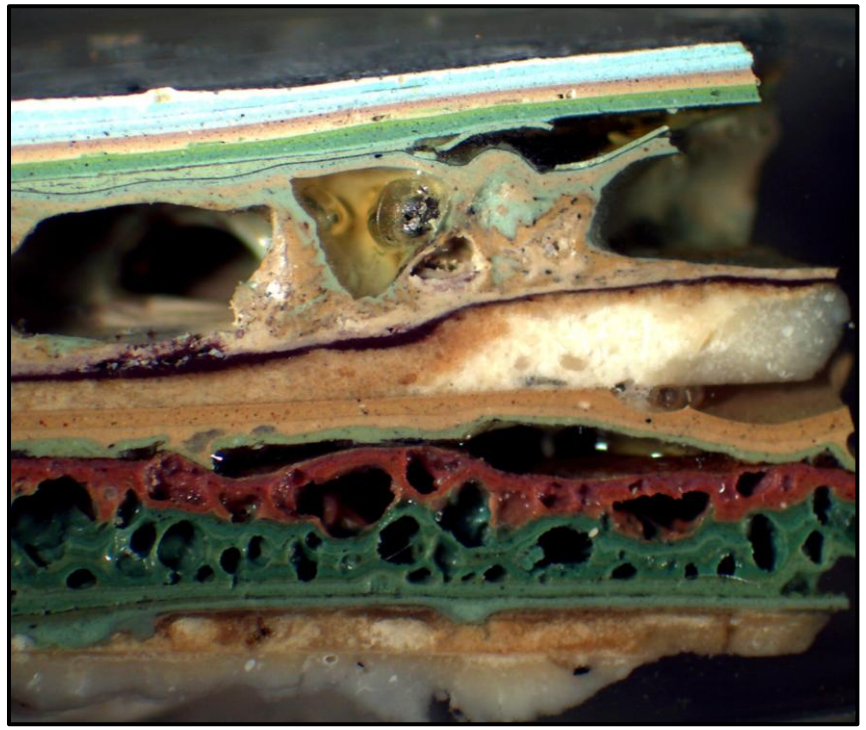
Comply with State Law: Under West Virginia Code § 16-35-3, abatement includes removal, encapsulation, enclosure, or replacement of lead-contaminated surfaces, along with proper cleanup and clearance testing.



Lead Paint Abatement

Safe Work Practices: If lead paint is present, use **lead-safe work practices**:

- **Contain the work area** with plastic sheeting and duct tape.
- Use a **HEPA vacuum** for cleanup and a **P100 respirator** with a full face shield.
- **Avoid dry sanding or high-heat methods** (e.g., heat guns above 700°F), which can vaporize lead.
- Use **wet scraping** or **chemical strippers** to minimize dust.
- **Wear full PPE**: Tyvek suit, gloves, safety goggles, and a respirator.



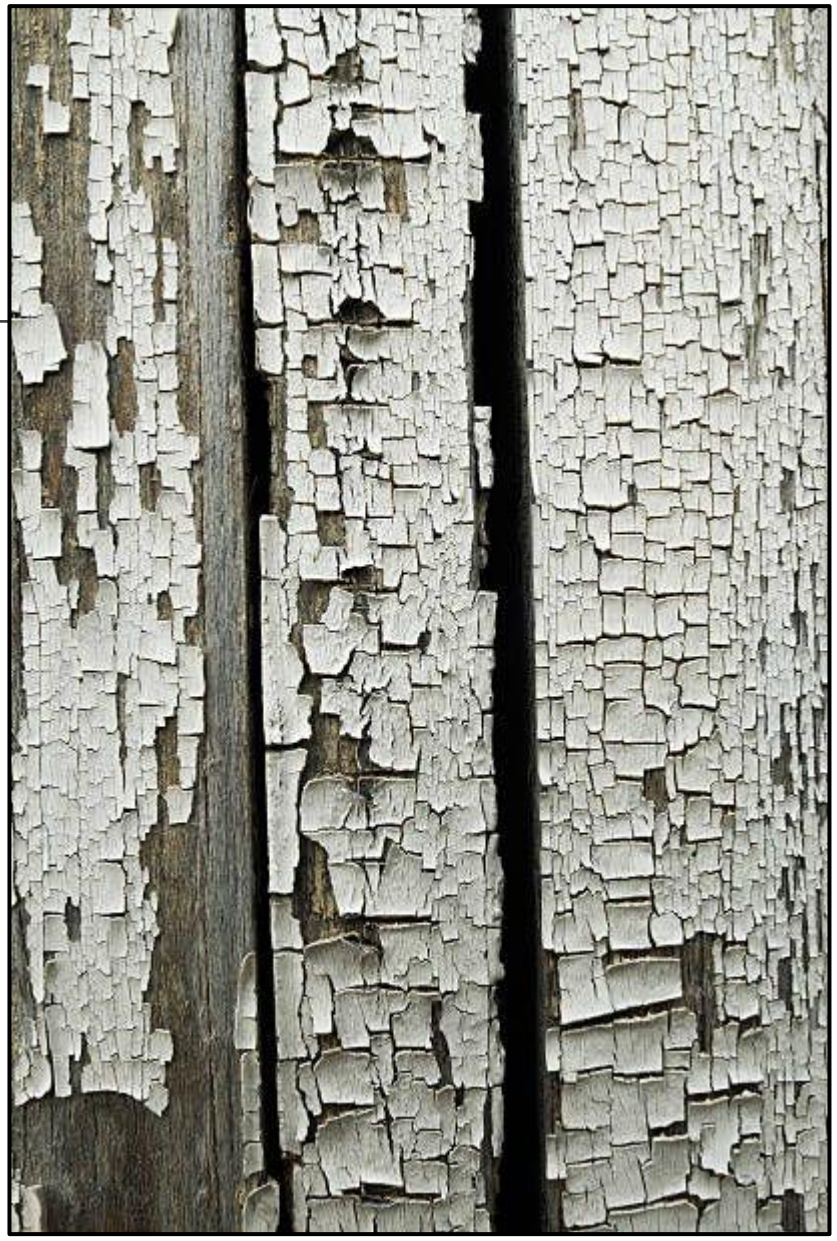
Lead Paint Mitigation

Choose a Lead-Safe Method: For historic windows, interim controls (mitigation) are often preferred over full abatement to preserve historic features. Options include:

•**Eliminating friction points** by inserting sliders or liners to prevent wood-on-wood contact.

•**Shaving down window edges and adding protective inserts** to reduce dust generation.

•**Stripping and repainting with lead-free paint**—though this may not eliminate lead content, as tested surfaces can still fail inspection.



Lead Paint Mitigation & Encapsulation Strategies

- **Encapsulation**: Apply a durable coating (e.g., paint or sealant) over lead paint to prevent dust generation. This is often sufficient for windows not in high-traffic areas.
- **Enclosure**: Install a liner or slider to eliminate friction between moving parts, reducing dust.
- **Partial Stripping**: Remove paint from high-friction areas (e.g., sash, jambs) and reapply lead-free paint.
- **Component Replacement**: Replace only deteriorated parts (e.g., sash, sill) with historically appropriate, lead-free materials—**avoid full window replacement unless necessary**.

Lead Paint Survey & Abatement

- **Professional Help**: It is **STRONGLY** recommended to hire a **certified lead abatement contractor** who has completed the EPA's Renovation, Repair, and Painting (RRP) Rule training or a preservation specialist experienced with historic windows.
- **Verification and Documentation**: After work, conduct a **dust wipe test** to verify clearance. Submit documentation to the health department for certification.
- **Funding and Support**: Explore **state or local grants, tax credits, or low-interest loans** for lead abatement in historic homes.

Asbestos Potential in Historic Glazing

Asbestos in historic window glazing is a known concern in buildings constructed between the 1930s and 1980s, when asbestos was commonly added to putty for its strength, fire resistance, and durability. The material is typically non-friable when intact, meaning it does not easily release fibers into the air, posing minimal risk if left undisturbed.

However, risk arises when the putty becomes damaged, cracked, or crumbly, especially during renovation or window replacement, as this can create airborne asbestos fibers. Intumescent (heat-expanding) putty is more likely to contain asbestos, and it may appear brown or dark grey.

- **Testing is essential:** If you suspect asbestos in window putty—especially in homes built before 1980—have a sample tested by a certified lab. This is the only way to confirm its presence.
- **Safe handling:** If the putty is in good condition, it's often safer to leave it undisturbed and manage it through encapsulation or routine maintenance. If removal is necessary, **professional abatement is strongly recommended** due to the risks of fiber release.

Historic Window Sash Restoration

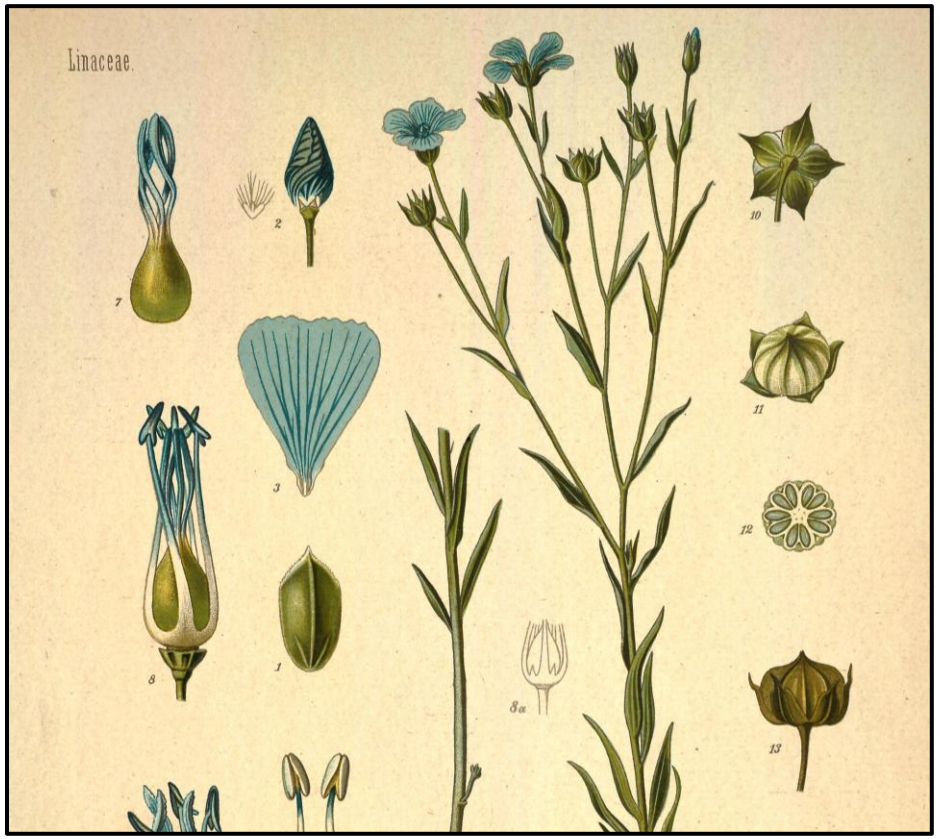
Sash Removal and Inspection: The restoration process begins with removing the sash from the frame for inspection. The sash is inspected for damage and failing paint—especially thick, rough, or lead-based. Paint is stripped using steam or infrared heat. Failing glazing compound is assessed by sound and sight; if the glass rattles, the bed putty must be replaced.

Repair and Preparation: Damaged wood is repaired using epoxy consolidation or Dutchman repairs (wood patches) with the same species as the original. Joints are separated, repaired, reassembled, and pinned—never permanently glued. After repairs, the sash is treated with heated boiled linseed oil (BLO) to recondition the wood. A 50/50 mixture of boiled linseed oil and denatured alcohol is applied to seal dry wood and prevent oil absorption.

Historic Window Sash Restoration

Glazing and Sealing: The glass is reset into the sash using traditional **linseed oil-based** glazing compound. Glazing points are used to secure the glass, and the compound is smoothed with a putty knife. The compound must be allowed to cure for several days before painting to ensure adhesion and moisture resistance.

(Linseed oil is an all-natural product from the flax plant).



Historic Window Sash Restoration

Painting and Final Assembly: The sash is primed with shellac at the glass rabbet and painted with oil-based paint. The first finish coat is applied before reglazing, and two additional coats are applied after reglazing. Paint should overlap the glass by no more than 1/16 inch to create a weather-tight seal. The sash is reinstalled with proper alignment and gap spacing, and V-bronze or nylon pile weather stripping is installed if compatible with the counterbalance system.

Maintenance: To extend the life of the restoration to 50 years, re-oil the sash with boiled linseed oil every 5–10 years as the paint dulls. Use high-quality, traditional linseed oil products and avoid modern latex or synthetic compounds that may degrade over time.

Service Life Expectation

A proper restoration of old-growth wooden windows with the proper techniques should last up to a

100-year service life.

If you protect your historic windows with proper maintenance, they will keep protecting you and your home.

Trusted Preservation Partners

List of contractors known for their work in historic preservation within the Shepherdstown region:

John Canning & Co., Ltd. (203) 272-9868

150 Commerce Court. Cheshire, CT 06410
info@johncanningco.com

Smith Bros Workshops (740) 340-0215

53958 Pike St, Neffs, OH 43940
https://www.smithfamilyofworkshops.com/

Keperling Preservation Services (717) 291-4688

Lancaster, Pennsylvania 17602
https://practicalpreservationservices.com/

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