

Don't Replace...Repair

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Articles

Top Ten Reasons to Repair or Restore Wood Windows.

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Secretary of the Interior Standards

Illustrated Guidelines for Rehabilitating Historic Buildings; BUILDING Exterior - Windows (1992). Prepared by: Technical Preservation Division, National Park Service. https://www.nps.gov/tps/standards/rehabilitation/rehab/windows01.htm

This document provides a description of the U.S. Secretary of the Interior's Standards for Rehabilitation before introducing the Guidelines for Rehabilitation. The Guidelines are intended to be used together with the Standards for Rehabilitation to provide a model process for property owners, developers, and Federal agencies. The "Windows" section provides a brief history of windows followed by a "Recommended" section in which approaches, treatments, and techniques that are consistent with the Secretary of the Interior's Standards for Rehabilitation are discussed. Approaches, treatments, and techniques that may adversely affect a buildings character are discussed in following section titled "Not Recommended." Photographs accompany various treatments to provide a visual example for the reader.

Preservation Brief #9 – The Repair of historic Wooden Windows (1981). Prepared by: Technical Preservation Division, National Park Service.

https://www.nps.gov/tps/how-to-preserve/briefs/9-wooden-windows.htm

This technical brief explains the architectural significance of windows and provides guidance on preserving, rehabilitating, and restoring historic windows. This publication helps historic property owners recognize and resolve common issues prior to starting their window project. Additionally, this brief is particularly useful to property owners that may be seeking local, state, or federal tax credits because it recommends methods and approaches for rehabilitating historic windows that are consistent with their historic character.

General Information on Historic Windows

Historic Window Guide (n.d.). Prepared by: the Conservation Team, Tewkesbury Borough Council. http://tewkesbury.gov.uk/CHttpHandler.ashx?id=872

This guide provides an illustrated history of window development in the United Kingdom from the Middle Ages to the present and a clear and concise explanation to the question, "Why are windows important?" Numerous photographs, diagrams, and illustrations are used to provide examples of styles, designs, and construction techniques of historic windows. This guide also provides a section on the history of glass and a glossary of window terms.

Historic Windows, (n.d.) By the Historic Preservation Education Foundation http://hpef.us/historic-windows

https://windowpreservationalliance.org/Library

This website is home to the on-line exhibit "Windows Through Time". The exhibit documents the history windows in the United States from 1630 through the 1950s by cataloging historic windows. Each entry contains a photograph of a historic window, its location, dimensions, a physical description and some historic background. The catalog's examples are an interesting collection that show how various windows were used in different types and styles of buildings.

Windows of Opportunity: Repair - Don't Replace Those Older Wood Windows (2013). By Rebecca Williams, National Trust for Historic Preservation. http://www.communitypreservation.org/enews/windows.htm

This short article discusses the benefits of retaining historic windows and makes the case for repair over replacement. In addition, the author provides some easy, low-cost tips for increasing the energy efficiency of historic windows and provides additional resources for further reading.

The Home of the Future? The home of the future may be older than you'd guess (2007). By James Hadley, AIA; Mar/Apr 2007: Home Economics (Vol. 10 No. 2).

http://www.architects.org/architectureboston/articles/home-future

In this article, author and AIA architect, James Hadley, discusses historic buildings in the context of environmental conservation. Hadley provides a definition for "embodied energy" and uses historic windows to illustrate why rehabilitation is an environmentally sound practice.

Energy Efficiency

What Replacement Windows Can't Replace: The Real Cost of Removing Historic Windows (2005). By Walter Sedovic and Jill H. Gotthelf. APT Bulletin: Association For Preservation Technology Vol. 36 No. 4. http://ohp.parks.ca.gov/pages/1054/files/replacement_windows%20sedovic%20gotthelf.pdf

This article discusses replacing historic windows in the context of preservation and sustainability. The authors use a scientific approach to evaluate various windows replacement options and historic window rehabilitation. They provide data regarding embodied energy values for various materials and provide a "Windows Replacement Worksheet" designed to help property owners estimate the savings (or lack thereof) of replacing existing windows with energy efficient upgrades. The issues of air infiltration, heat loss/gain, performance and material quality, aesthetics and authenticity, and ease of maintenance are also discussed.

Windows: Energy Efficiency Facts and Myths (2004). By Shanon Peterson Wasielewski http://www.dahp.wa.gov/sites/default/files/Windows%20Energy%20Efficiency%20Facts%20and%20Myths.pdf

This paper makes the case for the rehabilitation of historic wood windows by discussing the various arguments that property owners and small contractors often use to justify replacement. The author provides a case study on the cost/benefit analysis and includes a nice bibliography for further reading or information. It is important to note, that the authors assumptions of the costs associated with both the replacement window and the rehabilitation of a wood window are low and do not reflect current market standards.

Are Historic Window Energy Efficient? (2017). By Scott Sidler http://thecraftsmanblog.com/are-historic-windows-energy-efficient/

This article discusses the comparisons between replacement windows and historic double hung windows and includes testing completed by the Window Preservation Standards Collaborative showing different types of restoration and weatherstripping techniques and their relative effectiveness on the efficiency of historic wood windows.

Reports and Studies

Testing the Energy Performance of Wood Windows in Cold Climates: A Report to the State of Vermont Division for Historic Preservation (1996). Agency of Commerce and Community. Conducted By Brad James and Dr. David Hemenway, Department of Civil and Environmental Engineering, University of Vermont; Andrew Shapiro, Energy Engineer, Vermont Energy Investment Corporation; and, Steve Flanders, Research Civil Engineer, U.S. Army Cold Regions Research and Engineering Laboratory. https://www.ncptt.nps.gov/blog/testing-the-energy-performance-of-wood-windows-in-cold-climates-a-report-to-the-state-of-vermont-division-for-historic-preservation-agency-of-commerce-and-community-development-1996-08/

This study proposes to investigate "...the types of historic windows and viable methods for striking the balance between retaining a window's historic character and energy efficiency." In short, it was undertaken to test the assumption that historic wood windows can be retained and upgraded to approach the thermal efficiency of replacement sash or window inserts. This is a lengthy and scientific study presented in a scholarly format.

A Comparative Study of the Cumulative Energy Use of Historical Versus Contemporary Windows (2010). By Frank Shirley, AIA. Fred Gamble, PhD, Jarod Galvin, RA, LEED AP. https://www.architects.org/sites/default/files/Grant%20Final%20Report%2012-3-2010.pdf This study provides a great side by side comparison of the life-cycle costs of historic windows and replacement windows. The study was conducted in a pre-1940 house in Boston, Massachusetts and provides the total present value of all costs associated with a window system over its entire life. The study offers reasonable cost information and a great bibliography.

Saving Windows, Saving Money: Evaluating the Energy Performance of Window Retrofit and Replacement (2016). Produced by the Preservation Green Lab. http://forum.savingplaces.org/connect/community-home/librarydocuments/viewdocument?DocumentKey=59eab0e4-f0f4-45c5-97c8-

Among the most recent reports on this topic, this report offers insight for homeowners weighing the financial and energy tradeoffs between repairing and replacing historic windows. The analysis builds on previous research by examining numerous window improvement projects and comparing them to replaced windows across multiple climate regions. This report offers property owners, contractors, and design professionals convincing evidence of the merits of retrofitting windows as opposed to outright replacement. Local municipalities struggling with the issues of repairing or replacing their windows would also benefit from reading this report.

Presentations

Historic Denver, et al., "A Dollars and Sense Approach to Windows and Energy Efficiency," www.historicdenver.org (2012)

Books

Jordan, Steve, The Window Sash Bible: a A Guide to Maintaining and Restoring Old Wood Windows, Feb 16, 2015



The Window Sash Bible is about the repair, maintenance, restoration and improvement of old or historic windows made from about 1800 to 1940. With so much misinformation provided by replacement window contractors and vendors, this book aids homeowners, do-it-yourselfers, carpenters, architects, designers, preservation commission members, and anyone in the old-house business make sound decisions about windows. Since most homeowners are unaware of their alternatives, The Window Sash Bible provides an array of options to save money, energy, and historic windows for decades to come.

<u>Buy</u>

Sidler, Scott, Old Windows Made Easy



Old Windows Made Easy is the book for anyone who wants to learn the art of window restoration. This is NOT some technical manual that covers a bunch of obscure facts and techniques that only professional preservationists will find useful. Is is NOT a comprehensive explanation of the history and function of wood windows.

<u>Buy</u>

Meany, Terry, Working Windows: A Guide to the Repair and Restoration of Wood Windows



This definitive book covers the operation, care, repair, and restoration of all kinds of wood windows, along with chapters on weather-stripping, repainting, and refinishing.

<u>Buy</u>

Leeke, John Save America's Windows

Window Preservation Alliance - Library

Covers traditional methods and the latest in modern high-tech materials and techniques. Specific step-by-step repair and maintenance treatments. Window project profiles. 177 pages, 257 illustrations.

<u>Buy</u>

Window Preservation Standards Book



The national Window Preservation Standards book catalogs specific methods for the assessment, maintenance, repair, preservation and weatherization of older and historic wooden windows. Many detailed methods, procedures and materials are included, as well as basic strategies for saving older and historic windows. The Standards were developed and written by more than 100 window specialists who collaborated from all across the United States and Canada. 107 pages with 49 illustrations, color cover, black & white interior, 8.5" x 11".

<u>Buv</u>

Repairing Old and Historic Windows: A Manual for Architects and Homeowners



Repairing Old and Historic Windows Windows are a common problem in nearly every rehabilitation project should they be repaired or must they be replaced? What can be done to repair a waterdamaged sill? Can a window be retrofitted with storm windows? How can windows be replaced while still maintaining their historical integrity? Repairing Old and Historic Windows explores these questions and provides detailed information on how to go about refurbishing windows within current preservation standards. Written for homeowners, architects, builders, engineers, and preservationists, Repairing Old and Historic Windows is the complete and authoritative guide to window maintenance and repair. Chapters focus on window problems, including deterioration, weather damage, paint problems, and condensation; window maintenance, including cleaning, weatherstripping, and installing shutters; and window replacement, including design, fabrication, and installation. Some 140 photographs and illustrations, many of which are technical drawings, an

extensive glossary of window refurbishing terms, and a suggested reading list provide further ideas and guidance for undertaking the repair of old and historic windows. The complete primer on window repair and maintenance.

Buy

Old Windows In-Depth



Old Windows In-Depth is the complete window restoration handbook for anyone serious about restoring their historic wood or steel windows. Almost 200 pages of picture filled tutorials detailing all of the major obstacles that you'll encounter on the road to restoration.

This book is a greatly expanded version of Old Windows Made Easy, incorporating the text of the original book as well as 120 additional pages of tutorials and information to help you dig into the details of window restoration. This book covers the basic order of operations for the standard restoration of a double hung wood window, but doesn't stop there. You get additional tutorials like:

- Weatherstripping options (spring bronze, integrated metal, etc.)
- Alternative balances systems (tapes, spirals, jamb liners, etc.)
- Glass & paint options
- Casement techniques
- Single hung windows
- Advanced dutchman and & epoxy techniques
- Steel window restoration

For a simple and cost-effective window restoration book, choose Old Windows Made Easy

For the complete window restoration handbook, choose Old Windows In-Depth containing a full color cover and 190 pages of black & white interior.

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TOP TEN REASONS TO RESTORE OR REPAIR WINDOWS



1. BECAUSE YOUR WINDOWS FIT YOUR HOUSE.

Quirky as they might be, your older windows fit your house. Care was taken to match the weight and style of window to the building, the trim, etc. They have expanded and contracted with the seasons. With proper weather stripping they can be made to fit and seal even better. Replacement windows have a rigid structure that fits within your window openings. Old houses move and shift over time and frequently the gaps that open up around replacement windows and the window openings result in more drafts than the original windows.

2. BECAUSE YOU APPRECIATE GOOD CRAFTSMANSHIP.

The true mortise and tenon construction of antique windows is incredibly strong and even when it begins to weaken it is easily repaired. Many unique window shapes were created because of the craftsmanship with wood joinery. Antique windows were built to last, to be repaired as needed and to remain in use for as long as the house might stand, not to become landfill.

3. BECAUSE YOU VALUE GOOD MATERIALS.

Antique wood windows are constructed of old growth timber. The wood is more dense and more weather resistant than today's tree farmed softwoods. Delicate profiles are possible because of the density of the wood. The reason these windows are still around, even with years of neglect, is because the wood is of very high quality requiring no cladding or additional materials to give them weather resistance. Once all the old, cracking paint is removed, your wood windows are usually quite beautiful, graceful, and strong.

4. BECAUSE YOU LOVE THE CHARACTER OF ANTIQUE GLASS.

Even the glass in antique windows tells a story. It may be roundel or cylinder glass, each indicating a certain era of manufacturing. Old glass has varieties of color and texture that are a delight to the eye. Two layers of glass are better than one, and in an antique home that second layer of glass should be the storm window that protects the original window.

5. BECAUSE YOU THINK A WARRANTY SHOULD BE MORE THAN 20 YEARS.

Chances are your windows have done their job for fifty or more years already. Sure, they may be a little creaky and may not be as attractive as they once were, but it's a far better investment to repair a proven performer than to sink money into a new window that only has a 20 year warranty at best. With proper maintenance your antique windows will last for generations to come. Heck, even without maintenance they may last that long!

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TOP TEN REASONS TO RESTORE OR REPAIR WINDOWS

6. BECAUSE YOU WANT TO AVOID VINYL.

Poly vinyl chloride (PVC) is becoming one of the greatest concerns in the building industry. Not only does the production of it create an environmental nightmare, but the gases it emits over time are becoming a concern. In the event of a house fire, burning PVC releases toxic amounts of dioxin. In addition, Lead is used as a stabilizer in the manufacture of PVC. If you are concerned about our planet's health, and your own carbon footprint, you should read up on efforts to reduce the use of vinyl.

7. BECAUSE YOU WANT MORE LIGHT.

Replacement windows are set into the window opening, the sash is smaller than the originals, therefore you get less viewing area and less light. Who wants less light?

8. BECAUSE WINDOWS ARE A FUNCTIONAL PART OF YOUR HOUSE.

Weights and pulleys are the best balance systems ever invented. There is a prevalent myth that a lot of cold air comes in through the weight pocket. However, if there is cold air in the weight pocket it's generally because there is a gap between the outside trim of the house and the siding. It may also indicate a poor seal at the floor joists. Replacing easily serviceable weights and pulleys with vinyl jamb liners or invisible balance systems means installing a system that has a maximum life span of 10-20 years but generally fails in less time. You can't believe how joyful it is to open and close windows easily with one hand when everything is restored to the way it was designed to work!

9. BECAUSE YOU REALLY CAN SAVE 30-40% ON HEATING COSTS.

According to the Field Study of Energy Impacts of Window Rehab Choices conducted by the Vermont Energy Investment Corporation, the University of Vermont School of Civil and Environmental Engineering, and the U.S. Army Cold Regions Research and Engineering laboratory, the estimated first year energy savings between a restored wooden window with a good storm window vs. a replacement window was \$0.60. Yup, less than a buck. In their conclusions section they noted, "The decision to renovate or replace a window should NOT be based solely on energy considerations, as the difference in estimated first year savings between the upgrade options are small." Broken glass, failed glazing, no weather stripping – these small and repairable items are what really effect energy efficiency in windows.

10. BECAUSE THE GREENEST BUILDING IS ONE THAT IS ALREADY BUILT.

Replacement windows are touted as a way to save energy. But when evaluated from the perspective of the entire production, shipping, installation and removal process, replacing windows consumes a whole lot of energy, or viewed the other way, an older building has a great deal of embodied energy. If the total energy expenditure to manufacture replacement windows is considered, then the break even period stretches to 40-60 years. Sadly, replacement windows often fail long before that break even point is reached, whereas historic windows can last for generations. In the words of Richard Moe, President of the National Trust for Historic Preservation "We can't build our way out of the global warming crisis. We have to conserve our way out. That means we have to make better, wiser use of what we have already built." Restoration work can create up to 10 lbs of waste, but replacing windows generates around 50 lbs. of waste. Repairs and restoration work are done by local craftspeople paying local taxes. They use a minimum of materials and resources and a maximum of labor. Restoring windows is the best use of your embodied energy and the best way to support the local economy.

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