

Don't Replace - Restore!



An introduction to the preservation and restoration of historic wood windows

HISTORIC WINDOWS

Soul of the house



Wood

Pine, Mahogany, Cypress



Metal

Steel & Aluminum

Types



Fixed or Picture

Types



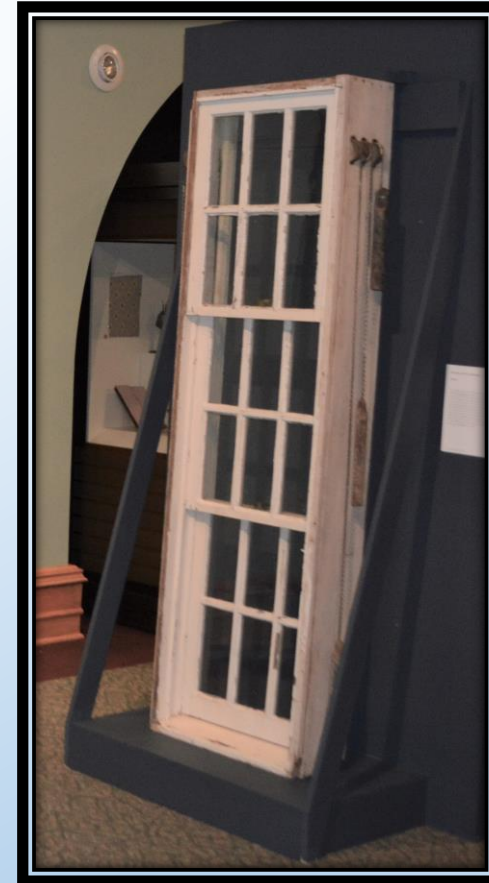
Slider or Glider

Casement



Types

Single or Double Hung



Triple hung

Types



Pocket

Lites

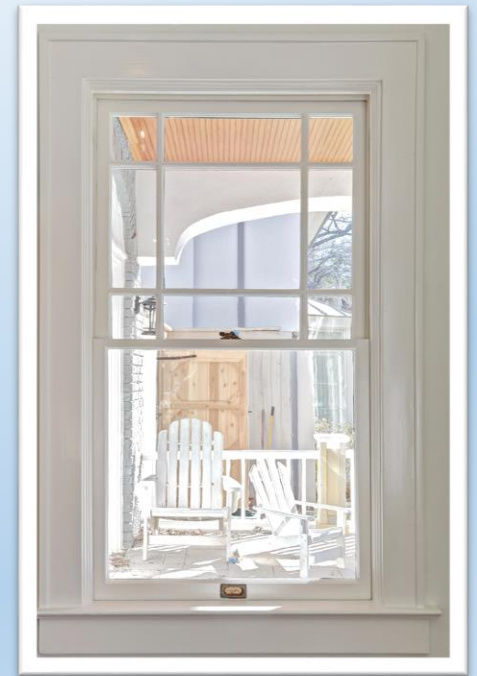
One over one



Two over two



Six over six



Nine over one

THE FOUR TREATMENT STANDARDS:

- Preservation:** the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property.
- Rehabilitation:** the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.
- Restoration:** the act or process of accurately depicting the form, features, and character of a property as it appeared in a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period.
- Reconstruction:** the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.



**The Secretary of the Interior's Standards
for the Treatment of Historic Properties**

www.nps.gov/orgs/1739/secretary-standards-treatment-historic-properties.htm

Going to focus on:

the maintenance and repair of existing historic materials



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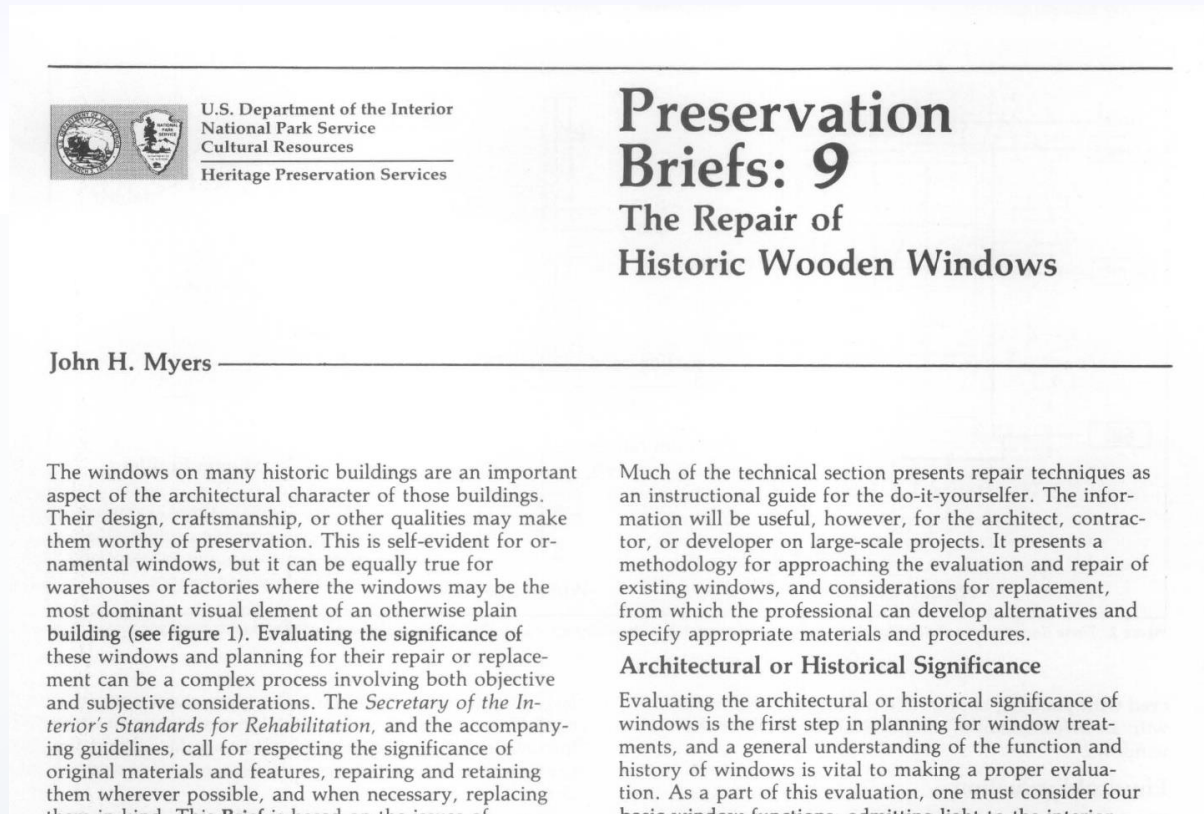
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Reconstruction: the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving side, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

Preservation Brief #9

<https://www.nps.gov/orgs/1739/upload/preservation-brief-09-wood-windows.pdf>



John H. Myers

The windows on many historic buildings are an important aspect of the architectural character of those buildings. Their design, craftsmanship, or other qualities may make them worthy of preservation. This is self-evident for ornamental windows, but it can be equally true for warehouses or factories where the windows may be the most dominant visual element of an otherwise plain building (see figure 1). Evaluating the significance of these windows and planning for their repair or replacement can be a complex process involving both objective and subjective considerations. The *Secretary of the Interior's Standards for Rehabilitation*, and the accompanying guidelines, call for respecting the significance of original materials and features, repairing and retaining them wherever possible, and when necessary, replacing them in kind. This Brief is based on the issues of

Much of the technical section presents repair techniques as an instructional guide for the do-it-yourselfer. The information will be useful, however, for the architect, contractor, or developer on large-scale projects. It presents a methodology for approaching the evaluation and repair of existing windows, and considerations for replacement, from which the professional can develop alternatives and specify appropriate materials and procedures.

Architectural or Historical Significance

Evaluating the architectural or historical significance of windows is the first step in planning for window treatments, and a general understanding of the function and history of windows is vital to making a proper evaluation. As a part of this evaluation, one must consider four basic window functions: admitting light to the interior

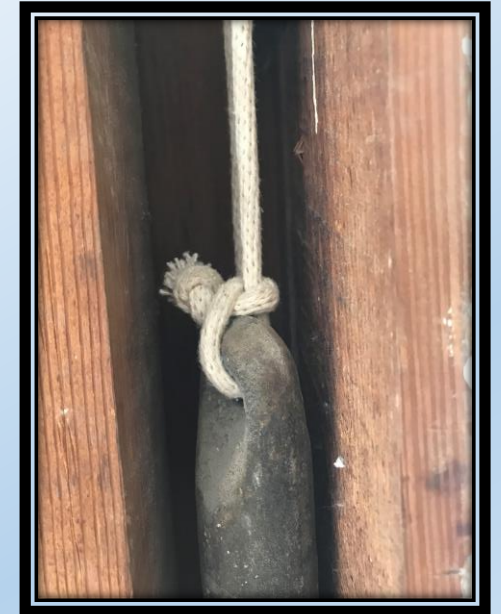
Possible Requirements or Restrictions

- Is there a historic designation
 - National Registry
 - Private conservation easement (rare)
 - Recorded Texas Historic Landmark (RTHL)
 - Preservation Tax Credits
 - Located in a historic designated neighborhood
 - Local designation – individual landmark
 - Historic preservation covenants or deed restrictions??



Most common issues

- Painted shut
- Ropes have broken
- Rails not meeting correctly
- Windows don't lock
- Drafty
- Rot and wood decay
- Interior condensation

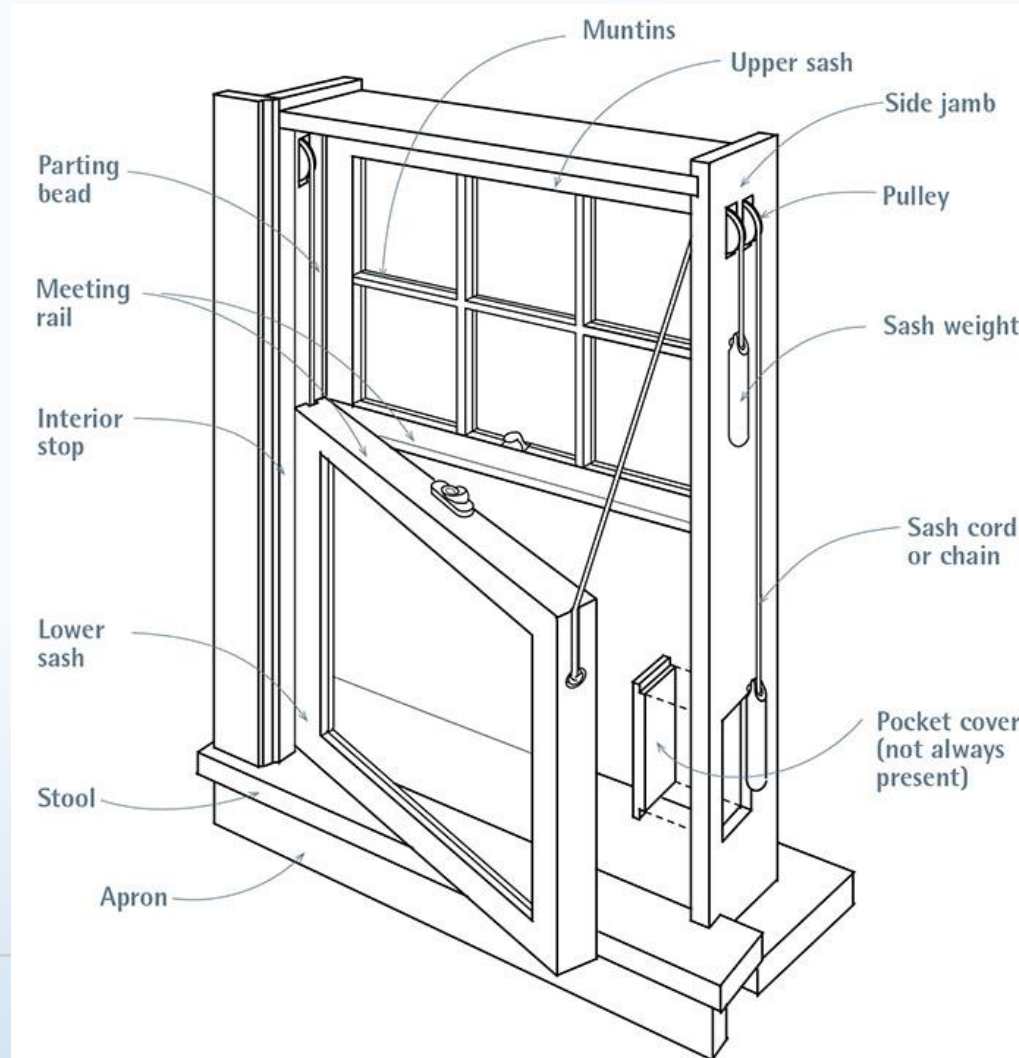


Most common failures

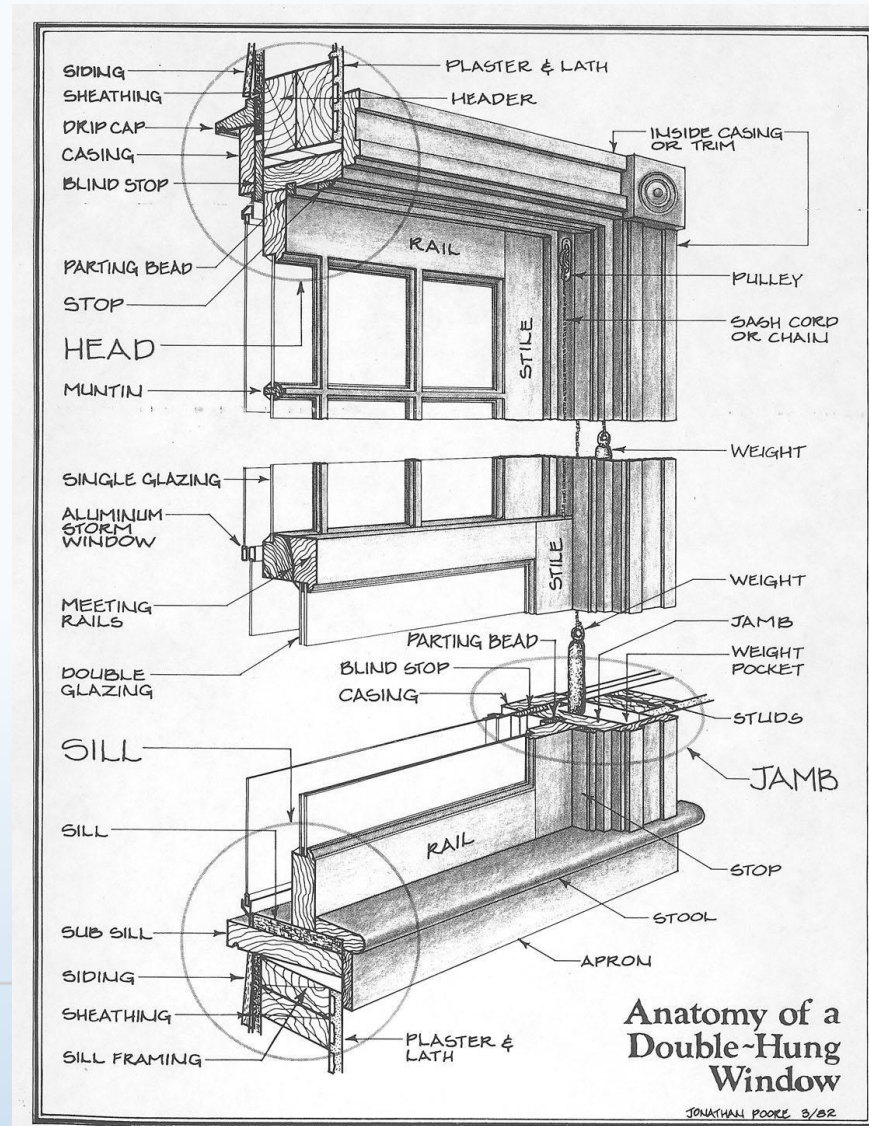
- Paint
- Putty
- Bottom rail of the upper sash warped or joint failure
- Window frame loose
- Window sill and sub-sill rot



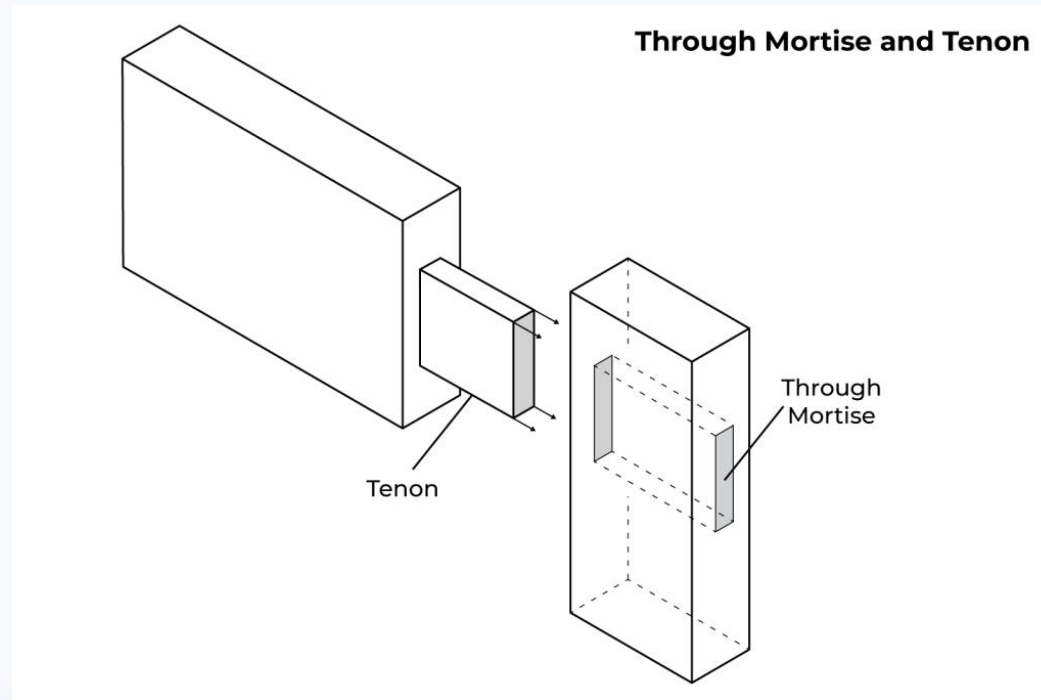
Window Parts



More Window Parts



Joinery



Dado - a slot cut across the grain of the wood. Generally the top and bottom of the frame

Groove - a channel cut with the grain. Runs along the length of a board typically for the parting stop.

Repair & Restoration Goals

Authenticity! Authenticity! Authenticity! Authenticity!

Think of that window as an artifact. Think of the house as an artifact.

Approach the work as a conservator.

Always attempt to restore before replacing.

Replace with like material.

Find *lots* of information at:

<https://www.nps.gov/orgs/1739/preservation-briefs.htm>



LUMBER



Most turn of the century homes (in this area) are frame built with “Old Growth - Long Leaf Pine”

Old Growth: Started growing a long, long time ago, grew for a very long time under a canopy of very old trees

Second Growth: Not as good as the old but better than new

New Growth: The faster it grows the better, but not for thee!

What about slow growth vs. old growth

MORE LUMBER

Replacement woods:

Reclaimed Long Leaf Pine
Sinker Cyprus - not the same as "Cyprus"
Vertical Grain Doug Fir
Mahogany
Sapele



TYPE	Board Foot Pricing	Hardness
Cypress	Select 4/4 = \$6.00 Pecky 4/4 = \$8.00	510
Doug fir	VG 4/4 = \$9.00	620
Mahogany	Genuine 4/4 = \$16.00 African 4/4 = \$5.00	800
Red Oak	4/4 = \$3.00	1200
Long Leaf Pine	4/4 (only) = \$11.00	1225
Red Grandis (Eucalyptus grandis)	4/4 = \$6.00	1420
Accoya - acetylated softwood timber	4/4 = \$12.50	1484

The Janka hardness ranking measures the resistance of different wood species to denting and wear, with higher numbers indicating harder and more durable woods. For example, Australian Buloke is one of the hardest woods, with a Janka rating of over 5,000 pounds of force, while Balsa is one of the softest at 67 pounds.

Janka hardness test uses a 2" x 2" x 6" piece of wood and a 0.444" steel ball.⁶ The steel ball is then pressed halfway into the piece of wood, and the force used for that determines the hardness of the wood.

Epoxies

These are the two I work with



Advanced Repair Technology (ART)

www.advancedrepair.com



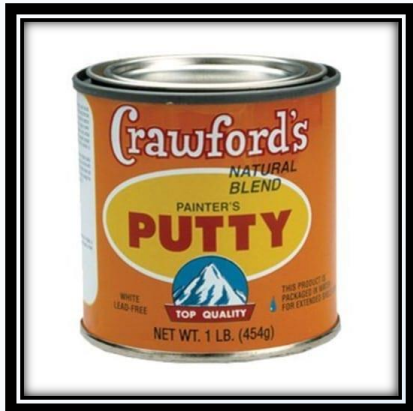
[Abatron](http://www.abatron.com)

Both are a two component epoxy and two part consolidant or primer

Putty



DAP "33"



Crawford's Painter's Putty



Red Devil Window Glazing Compound



Sarco MultiGlaze



Sherwin Williams "66" Glazing Compound

PAINTING

Please, do not buy the cheap stuff

Just say no to Bondo!

EPA Lead Safe Rules Check out: www.epa.gov/lead

Painting is one percent application, ninety nine percent preparation.

Primer & Linseed Oil

Raw Vs Boiled Linseed Oil

- both derived from the seeds of the flax plant
- raw takes longer to dry and is more prone to mold and mildew
- boiled has added drying agents and dries faster
- cut 1:1 with turpentine



ZINSSER® BULLS-EYE 1-2-3® WATER-BASED PRIMER

- Water based
- Goes over glossy or oil-based surfaces
- Quick drying

Paint Stripping & neutralize?



Citristrip



Smart Strip

Try to avoid products with methylene chloride or NMP (N-methyl-2-pyrrolidone)

Mechanical Paint Stripping

Sanding and Scraping

Hand Sanding: An effective method but labor-intensive.

Power Sanding: Take care to avoid damaging the underlying material.

Scraping: Good way to remove paint, especially on flat surfaces.

Heat or Hot Air Gun – Don't do it. Can vaporize the lead.

Infrared – Only if you are getting into the business. Expensive

All these methods require personal protective equipment (PPE) and dust control such as a HEPA Vac (High Efficiency Particulate Air).

Energy

The U-factor (the rate at which a window conducts non-solar heat flow) is not the main issue.

The solar heat gain coefficient (SHGC) (a measure of solar Radiation admitted through a window) is not the issue

Air infiltration is the major window energy loss issue

Energy Findings

The Study:

saving windows, saving Money:

evaluating the energy Performance of window retrofit and replacement

commissioned by the Preservation Green Lab - National Trust for Historic Preservation,
and funded by The National Park Service

The Findings:

Building on previous research, the study examines multiple window improvement options, comparing the relative energy, carbon, and cost savings of various choices across multiple climate regions.

Results of this analysis demonstrate that a number of existing window retrofit strategies come very close to the energy performance of high-performance replacement windows at a fraction of the cost.

Energy Saving Remedies

aka Treatments

- Check existing windows for air leaks. Repair
- Caulk and weatherstrip.
- Add window treatments and coverings.
- Add storm windows or panels
- Add solar control film
- Add exterior shading, such as awnings, exterior blinds, or overhangs.

Resources

www.windowpreservationalliance.org

<https://www.nps.gov/orgs/1739/preservation-briefs.htm>

Books:

Save America's Windows
by John Leeke

The Window Handbook
National Park Service

Window Preservation Standards
Window Preservation Standards Collaborative

Window Rehabilitation Guide
Historic Preservation Education Foundation

Window Parts and Hardware

Glass: [Architectural Glass](#) [Hollander Historic](#)

Swisco: www.swisco.com

SRS Hardware: www.srshardware.com

Samson Red Spot Sash Cord

Indoor Storm Windows

www.indowwindows.com

www.windowssaver.com

Dorbin Metal Strip Mfg. Co., Inc.

2404 South Cicero Ave.

Cicero, Illinois 60804-3492

Top Ten Reasons To Restore

1. Because your windows fit your house.
2. Because you appreciate good craftsmanship.
3. Because you value good materials.
4. Because you love the character of antique glass.
5. Because you think a warranty should be more than 20 years.
6. Because you want to avoid vinyl.
7. Because you want more light.
8. Because windows are a functional part of your house.
9. Because you really can save 30-40% on heating costs.
10. Because the greenest building is one that is already built.

SIEBLER

Historic Preservation & Restoration

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