



Wood Windows

Maintain or Replace



Wood Windows

Maintain or Replace

Maintain



Maintain



Residential Cost Calculator

Provides cost comparison of several key exterior features, including windows, siding, eaves & cornices, trim, doors, porch features, and exterior flooring.



Commercial Cost Calculator

Provides cost comparison on several common commercial property items, including windows, entry doors, cornices & eaves, flooring, plaster, and brick masonry.

Fort Collins, Colorado

<https://www.fcgov.com/historicpreservation/costcalculator>



Historic Windows are Sustainable

Maintain





Maintain

Common Myths:

Historic Windows can't be Refurbished or Repaired

- My old windows are rotted and couldn't possibly be restored.
- My old windows have lead paint.
- My old windows have broken ropes or chains, so I can't lift my windows without a prop.
- My old windows have missing or broken glass, or the glass panes rattle around.
- My old windows have old putty that is falling out.
- My old windows are inefficient — air pours right through them.
- My steel casement windows are rusted and can't be fixed.

Maintain

Window Conditions & Repairs Rating System		For homeowners interested in repairing their historic windows, this rating system was compiled based on skill level and material costs.					Check your state and local codes before starting any project. Neither the HCBA, any contributors or retailers can be held responsible for damages or injuries resulting from the use of the information in this document.	
Repair Level	Issue	Solution	DIY	Professional	Time	Material Cost	Resource	Notes
i. Basic	A. <i>Mold/Mildew</i> : Symptomatic of and encourages moisture retention, hazardous to health, prohibits operability	Clean mold/mildew with a heavy-duty cleaner or a mixture of detergent & water. Allow to dry and then sanitize with a bleach solution (1/4 c. bleach per gallon water).	✓	✓	15-30 min. per window	Bleach \$5; heavy duty cleaner: \$5-15	Any local hardware or grocery store, http://www.epa.gov/mold/cleanupguidelines.html	Non-porous materials such as solid wood can usually be easily cleaned of mold.
	B. <i>Missing Hardware</i> : Prevents the window from operating properly & conveniently, which can lead to deterioration	Seek replacement(s) that match original and install new hardware.	✓	✓	15 min. per window	Hardware ranges from \$2-25	Local hardware store, Rejuvenation, House of Antique Hardware, Kilian Hardware, thehardwarehut.com , architectural salvage	See Glossary for hardware types and descriptions
	C. <i>Squeaky Hardware</i> : A pulley, metal sash chain, meeting rail lock, or latch that squeaks or is difficult to operate	Apply "lube" like WD-40. Spray affected area, open & close the device several times to get it worked into the hardware and evenly applied. Repeat until it is easier to operate and no longer squeaks. Wipe excess.	✓	✓	5 min. per window	WD-40 \$5	Any local hardware store, Amazon.com, http://www.ehow.com/how_7857480_lubricate-oid-interior-door-hardware.html	Lubrication will only help if the hardware is clean and free of excess paint and rust. See Intermediate Conditions for a guide to over-painted and rusted hardware repairs.
	D. <i>Small Air Leaks</i> : These are small areas around the window where air drafts cause discomfort and energy loss.	<u>Weather-stripping</u> tape, felt and/or removable caulk are highly effective ways to temporarily reduce air infiltration around small gaps in windows. Feel for drafts at the perimeter and meeting rail. Follow packaging instructions for proper installation. If A/C units are left in place during colder months, be sure to cover any gaps to help reduce drafts.	✓	✓	15-30 min. per window	Foam weatherstrip tape \$5-15; removable caulk \$8-10; caulk gun \$10; A/C unit cover \$5-10	Any local hardware store, Amazon.com, http://www.acehardware.com/info/index.jsp?categoryid=1282811&backTo=3440730&savePath=2568443.2568451.2626208.2626341.2627448&infoType=infosport	Depending on the specific type, these forms of weatherstripping may be temporary solutions and will need to be replaced. Permanent weatherstripping options are addressed in Advanced Conditions below. It is best to remove and store A/C units in colder weather.
	E. <i>Over-paint on Glass</i> : Careless and sloppy painting make windows look dirty and unfinished.	Use window cleaner or dish soap solution and a straight edge blade to carefully scrape old paint off of the glass.	✓	✓	5-15 min. per window	Window cleaning solution \$3-10; Utility Blade \$3	Any local hardware store, http://www.freewindowcleaningtips.com/paintremoval.htm	Be very careful to lay the straight edge blade flush with the glass so as not to scratch the glass. Never scrape with a dry blade: always scrape a wet/slippery surface.
	F. <i>Storm Window Check</i> : Without proper maintenance, a <u>storm window's</u> efficiency can be greatly diminished and may allow or cause damage to the primary window frame.	Be sure that storm windows are properly closed and caulked around the exterior perimeter. The storm window <u>weep</u> s (small holes at the sill) and the space between the window and storm should be clear of dirt, debris, and caulk in order to properly vent and discharge moisture.	✓	✓	30-45 min. per window	Caulk \$8-10; Caulk gun \$10	Any local hardware store, Amazon.com, http://www.thisoldhouse.com/toh/article/0,,476717,00.html	If there are no storm windows or the existing storms do not function properly, see Advanced Conditions for a guide to finding new storm windows or repairing damaged storm windows.

Maintain

Window Refurbishment and Repair Contractors

MADISON TRUST



for **Historic Preservation**

Maintain

Window Refurbishment and Repair Contractors

Adams Architectural Millwork Co.

2225 Kerper Blvd., Dubuque, IA 52001

Contact: Chad Lueken

Email: info@adamsarch.com

Toll Free Phone: (888) 285-8120

Phone: (563) 557-8851

Cell: (563) 690-1358

Fax: (563) 557-8852

Architectural Building Arts*

720 Hill St., Madison, WI 53705

Contact: Aaron Monroe

Email: aaron@designbuildmadison.com

Phone: (608) 233-2106, ext 353

Cell: (608) 345-7725

Fax: (608) 233-2146

Community Building & Restoration

125 W. Melvina St., Milwaukee, WI 53212-1127

Contact: Alexander Montozon

Email: amontezon@gmail.com

Phone: (414) 963-1901

Cell: (414) 217-6222

Fax: (414) 332-2105

Hansen Carpentry & Repair

154 Dunning St., Madison, WI 53704

Contact: Jim Hansen

Cell: (608) 515-7781

Historic Window Repair

143 Maple Ave., Columbus, WI 53925

Contact: Iver Bryan

Email: iverbryan@gmail.com

Cell: (608) 219-9652

Maintain

Window Refurbishment and Repair Contractors

Macaulay Artisan Carpentry

449 N. Baldwin St., Madison, WI 53703

Contact: Mark Macaulay

Email: macartisancarpentry@gmail.com

Cell: (608) 695-0219

Martin Glass

2323 Atwood Ave., Madison, WI 53704

Contact: Curt Martin

Email: martinglassmadison@gmail.com

Work: (608) 249-0474

Matchless Restoration

1337 Gilson St., Madison, WI 53715

Contact: Patrick Kelly

Email: patrick@matchlessrestoration.com

Cell: (608) 588-5383

Madison, WI 53701-0296

RW Restoration Carpentry & More

123 Milky Way, Madison, WI 53718

Contact: Ray Lideikis

Email: raywl2010@gmail.com

Phone: (608) 556-2420

Cell: (608) 556-2420

Sash-A Restoration

2137 Sommers Ave., Madison, WI 53704

Contact: Pam Barrett

Email: sasharestoration@gmail.com

Cell: (608) 345-6392

Tim's Woodworking

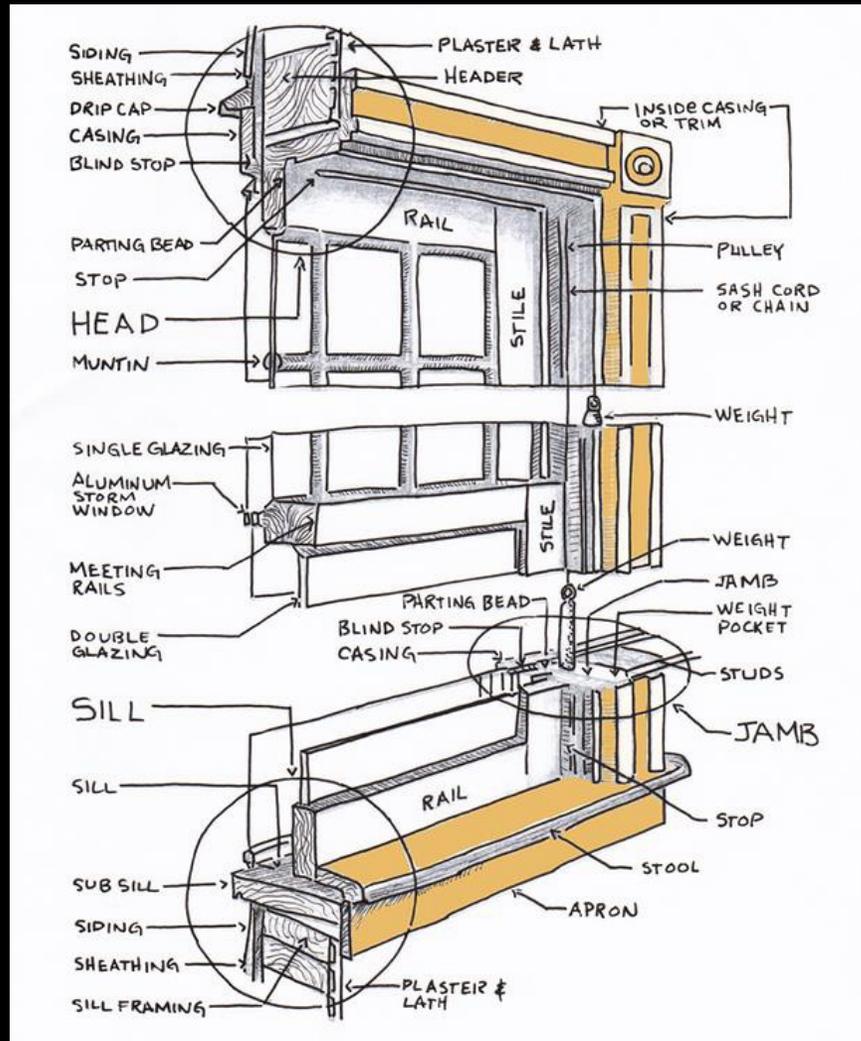
4210 Jerome St., Madison, WI 53716

Contact: Tim Diedrich

Email: tim.woodworking@gmail.com

Cell: (608) 332-2462

Maintain



Anatomy of a double-hung sash window
Courtesy of the Chicago Bungalow Association

Maintain



Maintain



Maintain



Maintain



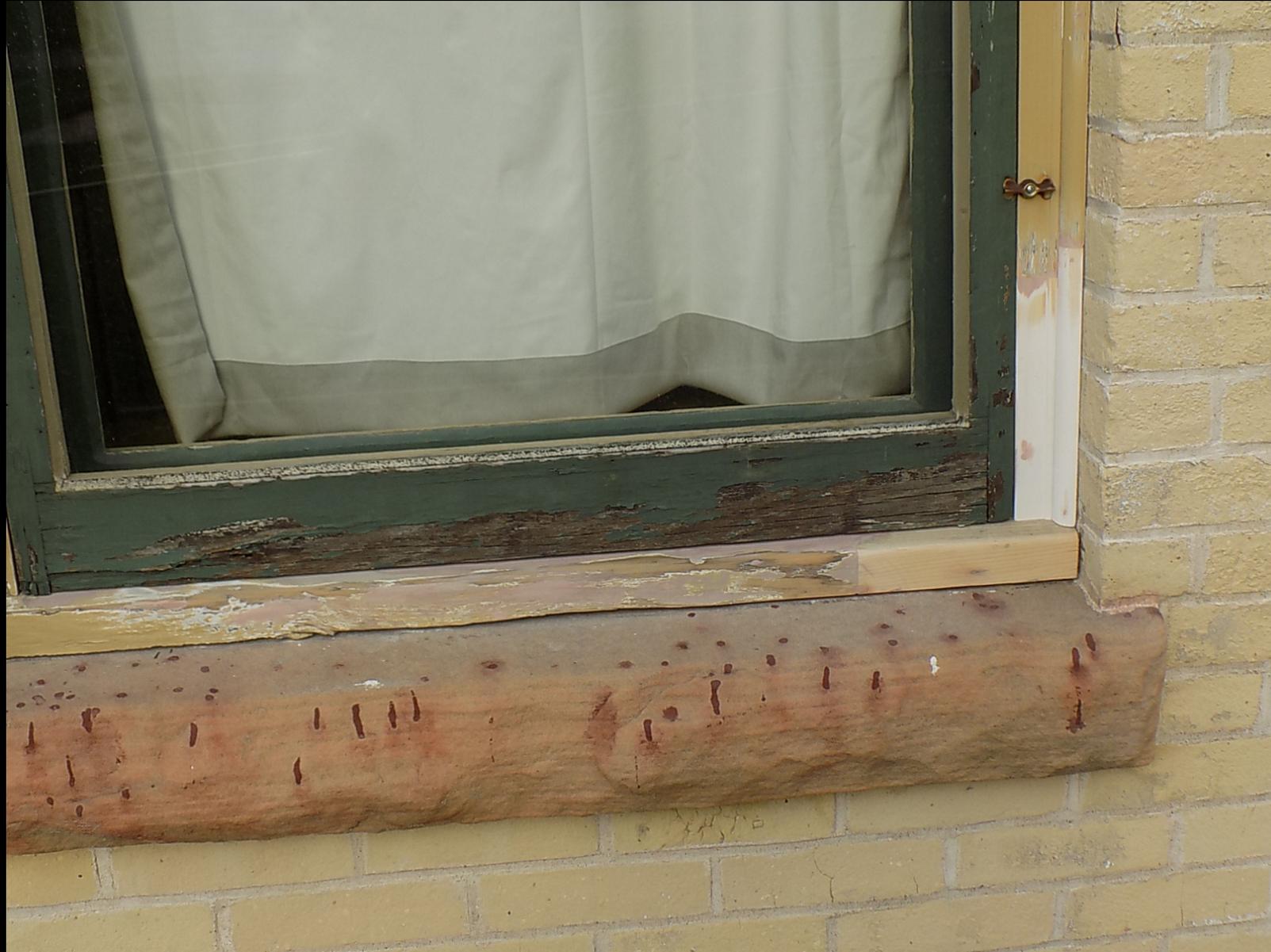
Maintain



Maintain



Maintain



Maintain



Maintain

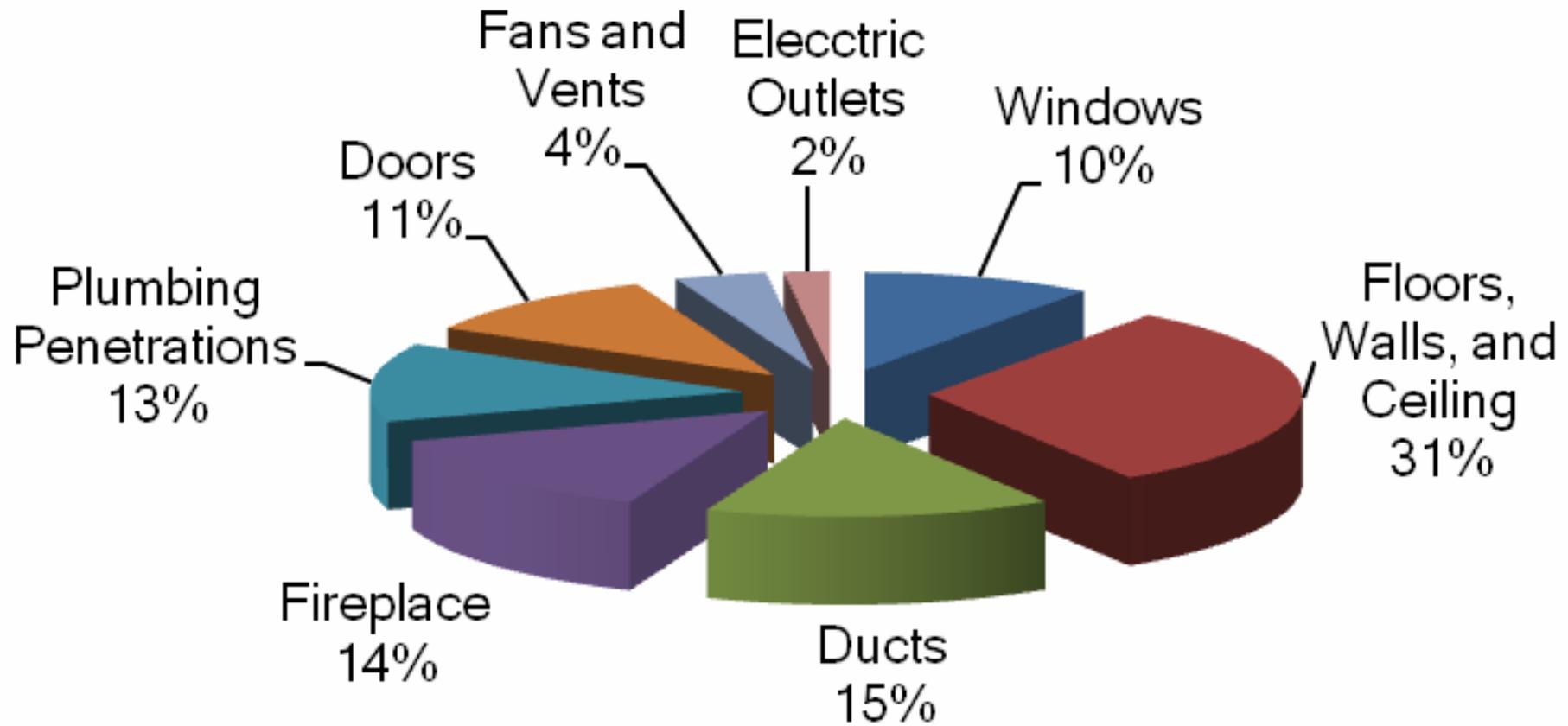


<https://www.bing.com/videos/search?q=abatron+wood+epoxy&view=detail&mid=91DAEF75267372128E3891DAEF75267372128E38&FORM=VIRE>

Maintain

Causes of air leaks in homes

(http://www1.eere.energy.gov/consumer/tips/m/air_leaks.html)





Office of
ENERGY EFFICIENCY & RENEWABLE ENERGY

WEATHERIZATION ASSISTANCE PROGRAM

<https://www.energy.gov/eere/wap/weatherization-assistance-program>

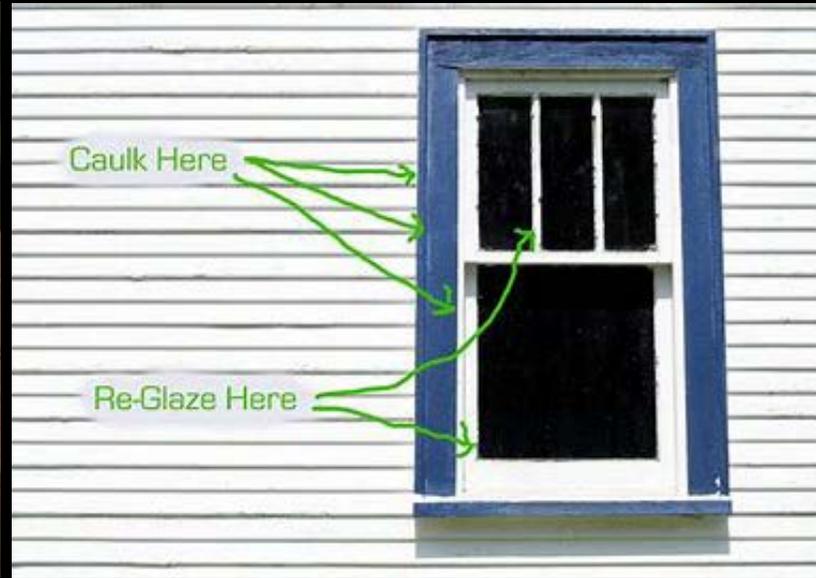
Maintain

Weather Stripping

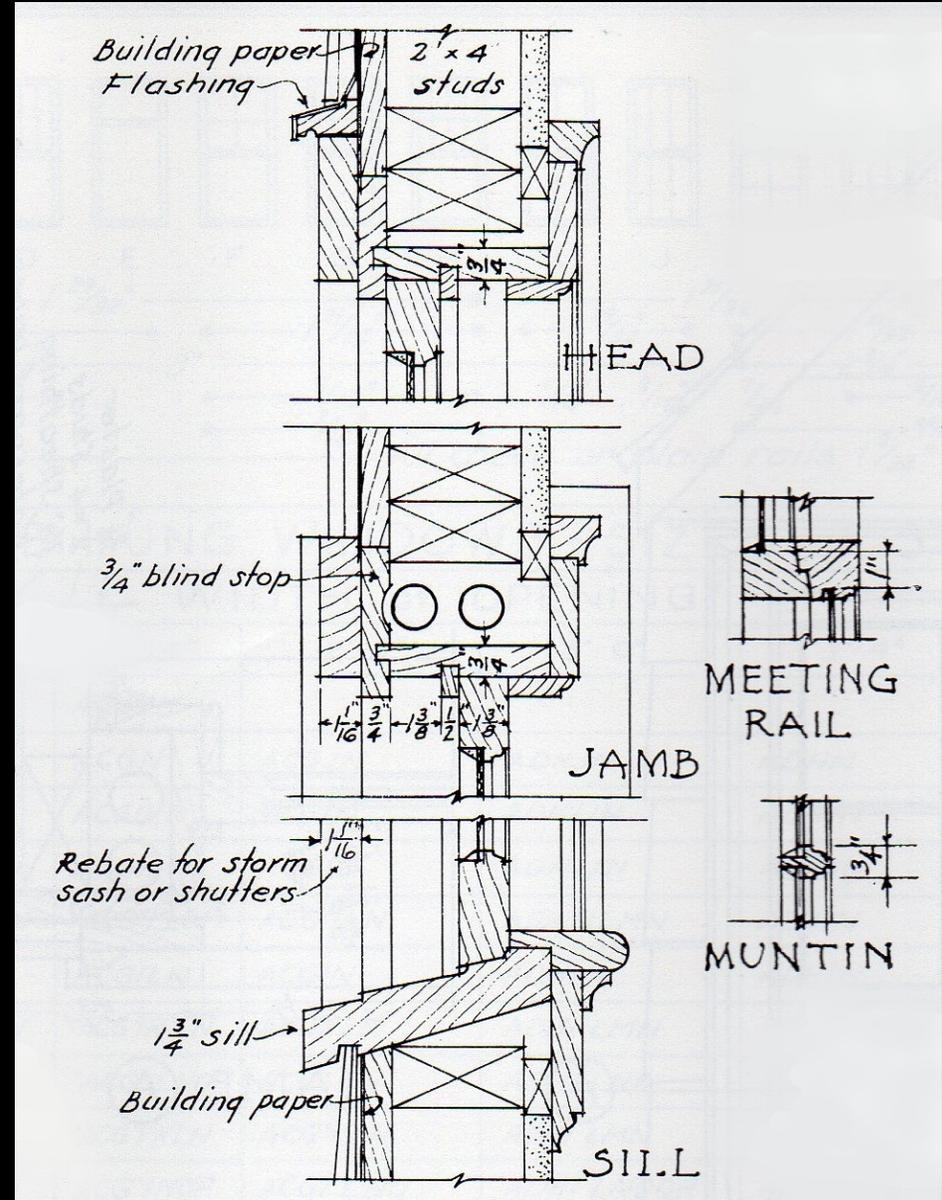
Increase energy efficiency up to 50%

- Permanent Metal Spring or Interlocking
- V-Strip
- Felt
- Foam Tape
- Tubular Rubber, Vinyl, or Silicone
- Caulk
- Plastic Wrap

Maintain



Maintain





Historic Windows have Storms

Maintain





Historic Windows have Storms

Maintain



Second Era Millwork, 1870-1940



https://www.westonmillwork.com/american_millwork_catalogs



Historic Windows have Storms

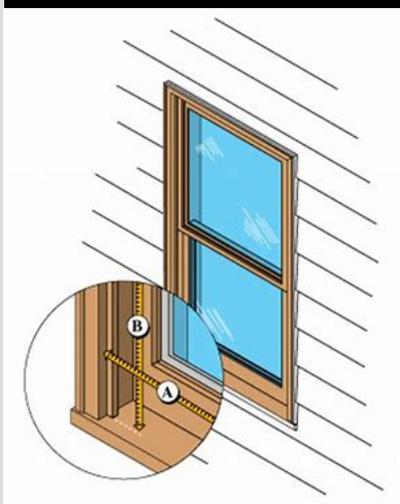
Maintain



Self-storing Storms



Exterior Storm Windows



Replicated Storms



Interior Storm Windows



Selecting an Appropriate Replacement Window for Your Historic Building

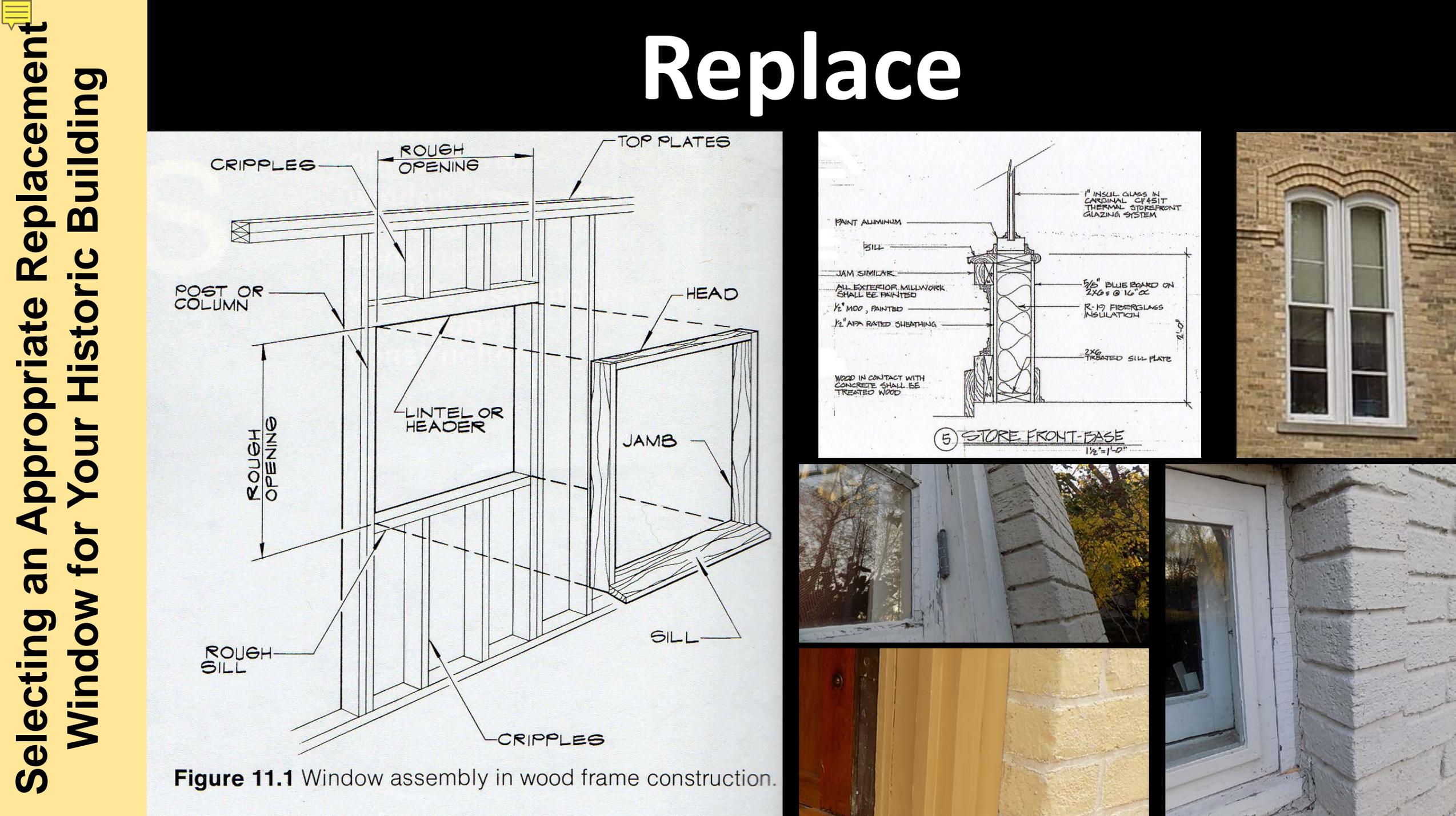
Replace



Selecting an Appropriate Replacement Window for Your Historic Building

Replace





Replace

Selecting an Appropriate Replacement Window for Your Historic Building

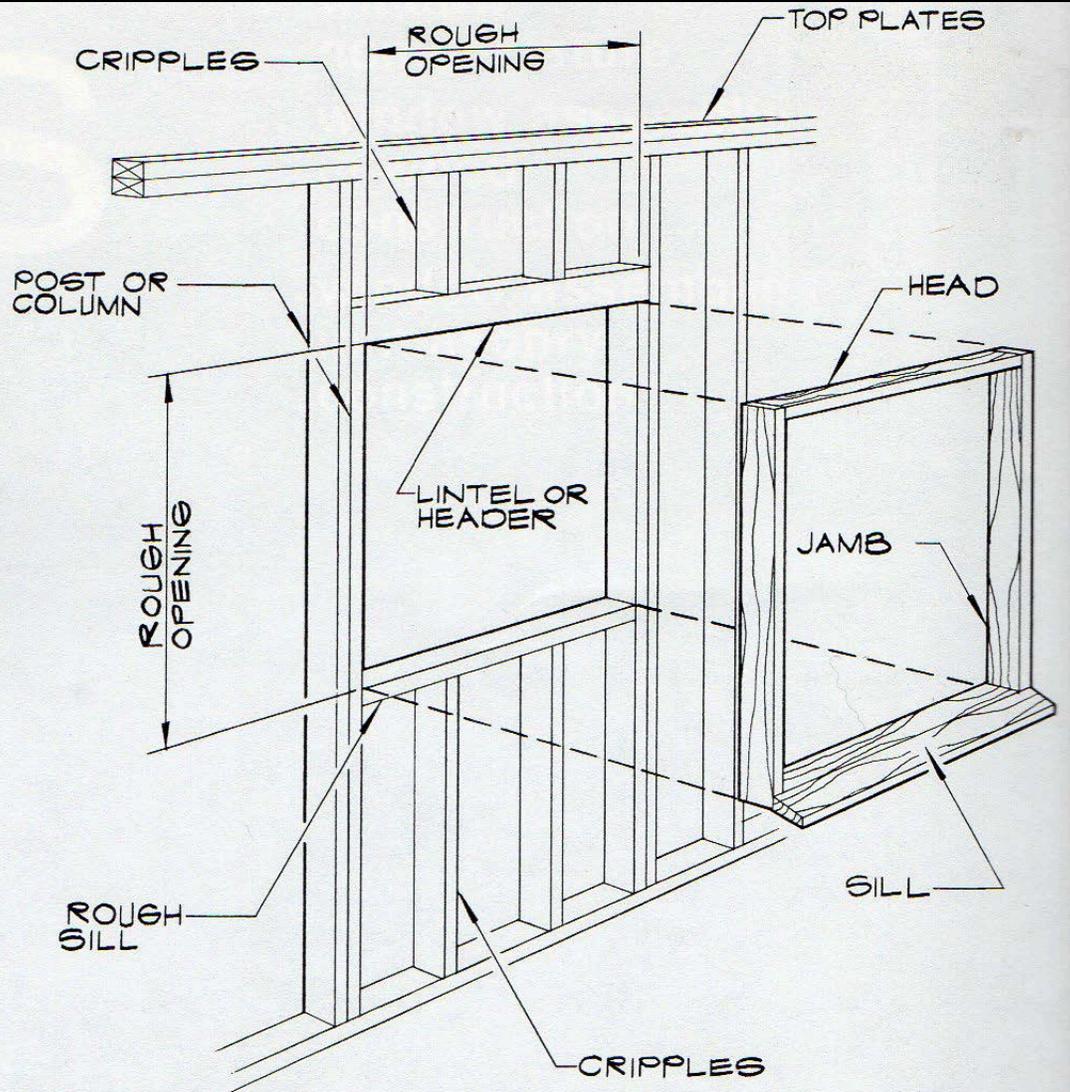
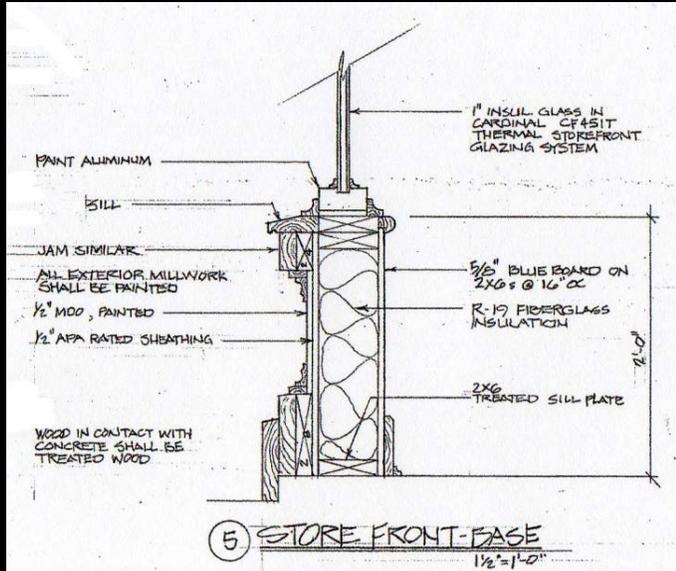


Figure 11.1 Window assembly in wood frame construction.





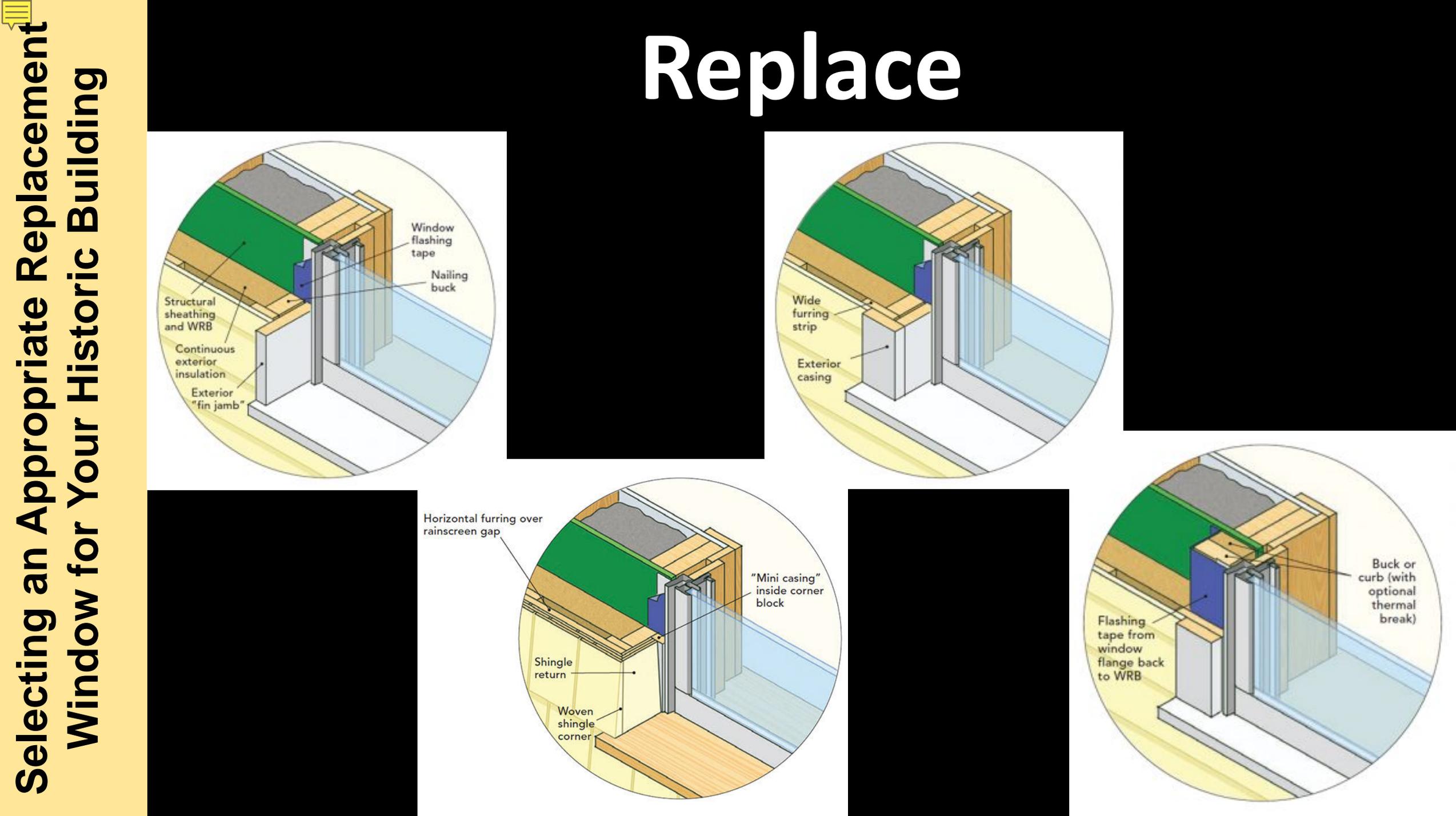
Selecting an Appropriate Replacement Window for Your Historic Building

Replace

Selecting an Appropriate Replacement Window for Your Historic Building

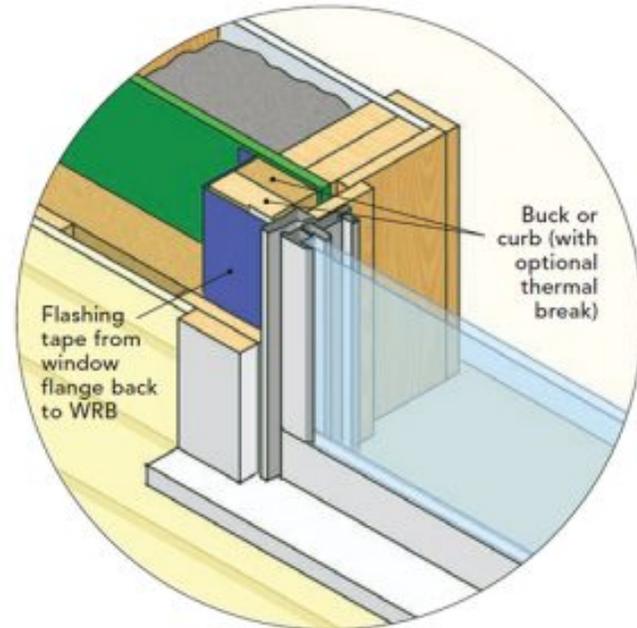
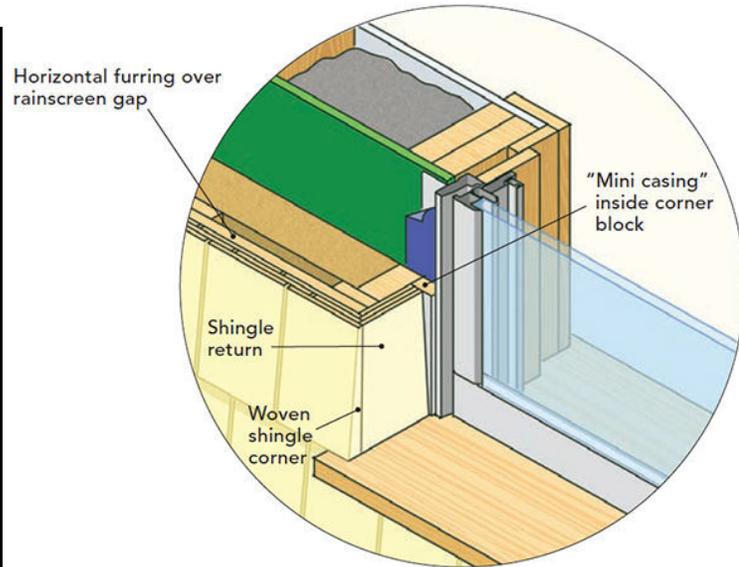
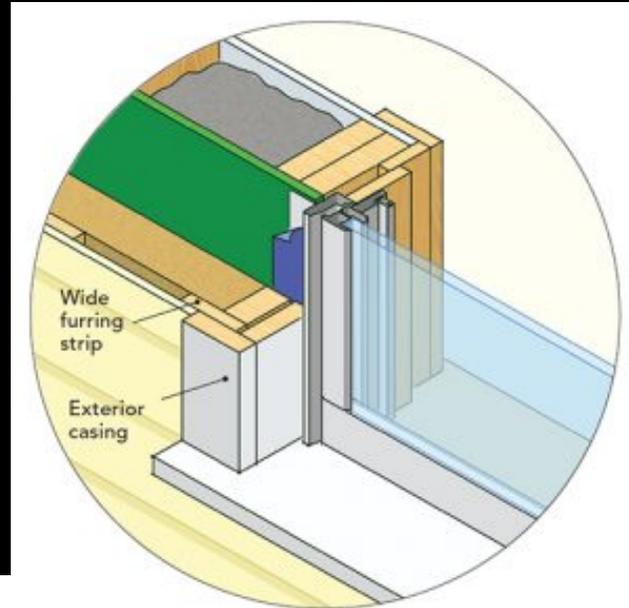
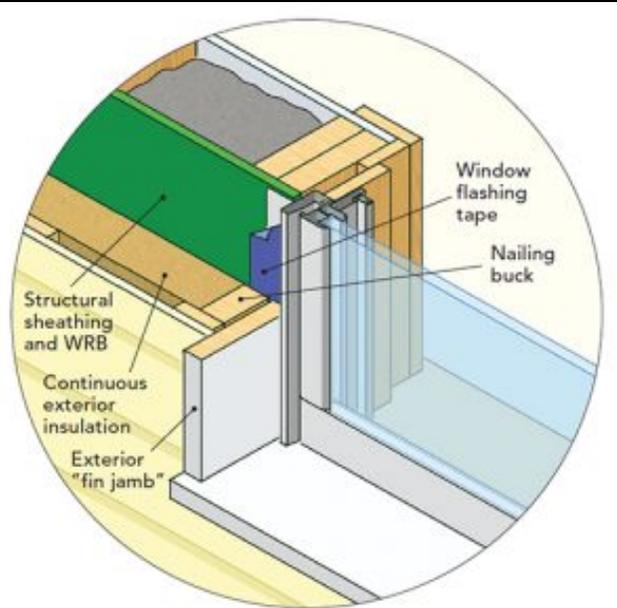
Replace



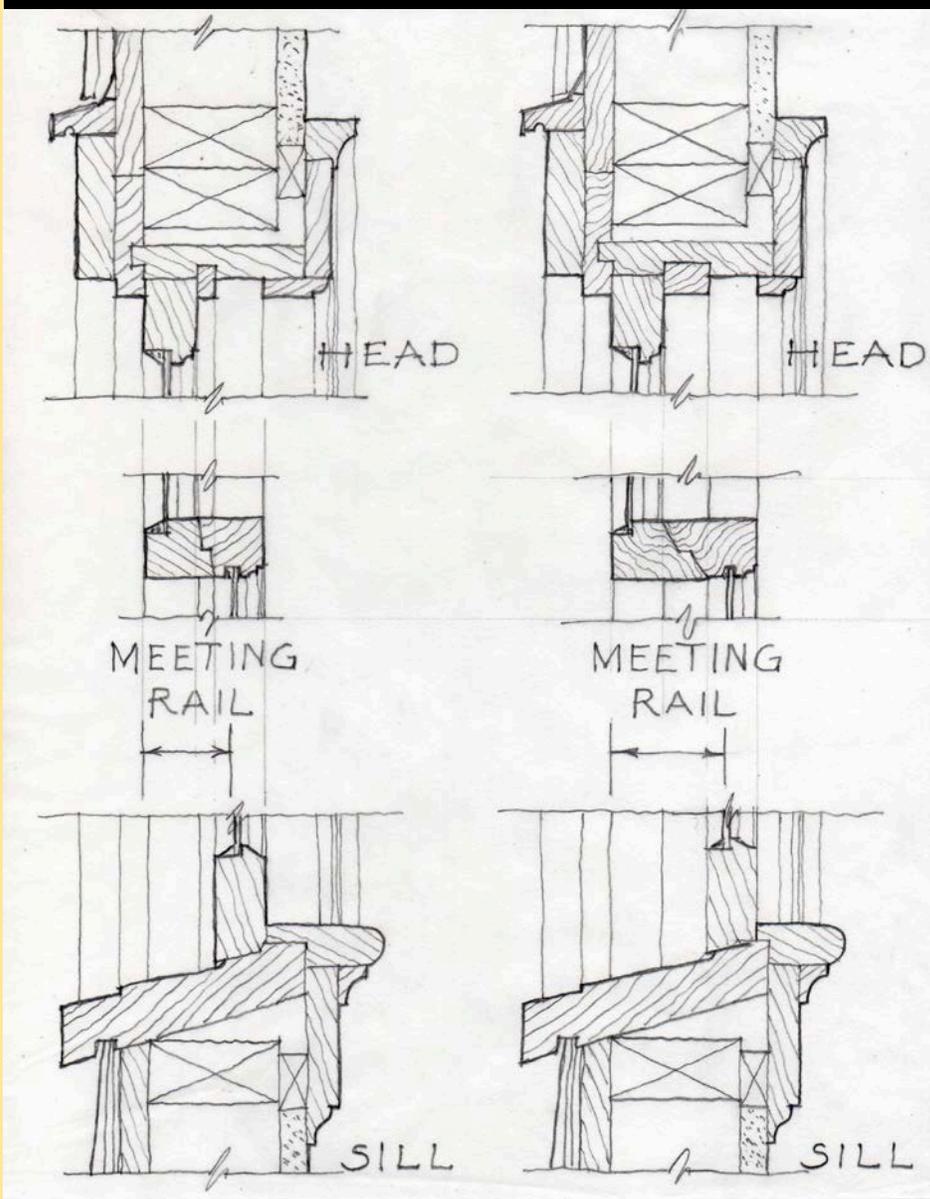


Selecting an Appropriate Replacement Window for Your Historic Building

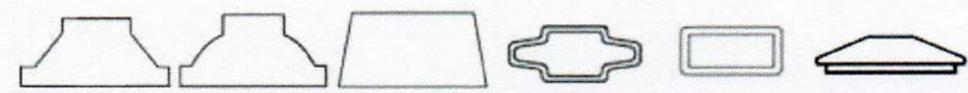
Replace



Replace



Grille Profiles are available in widths ranging from 5/8" to 2-1/4"



Stock stick on Muntins
For replacement windows

Selecting an Appropriate Replacement Window for Your Historic Building

Replace



Embossed Woodgrain Vinyl





Replace

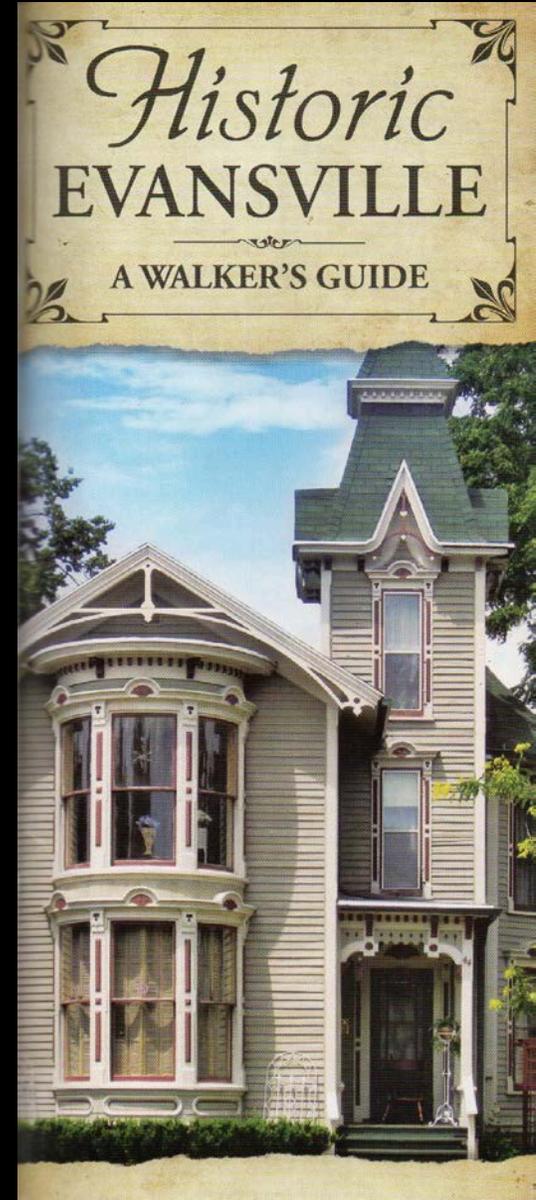
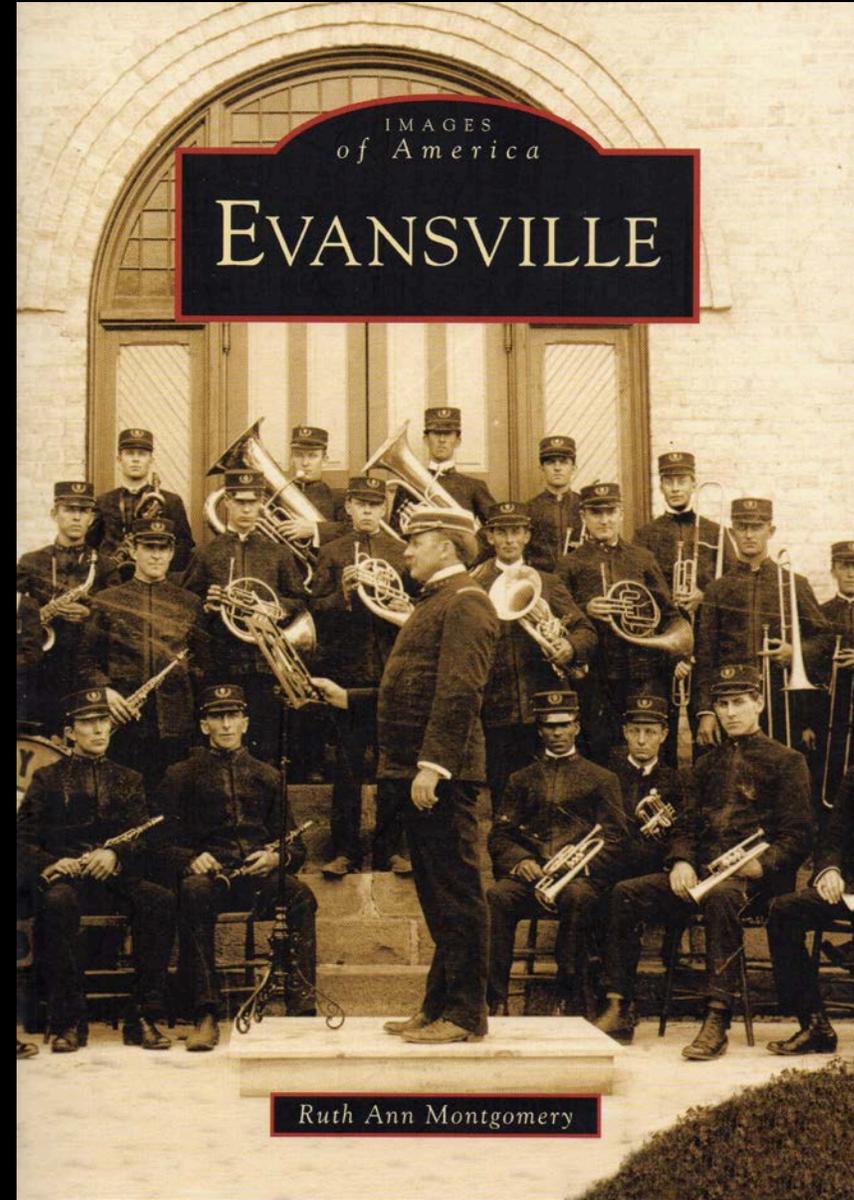
Selecting an Appropriate Replacement Window for Your Historic Building

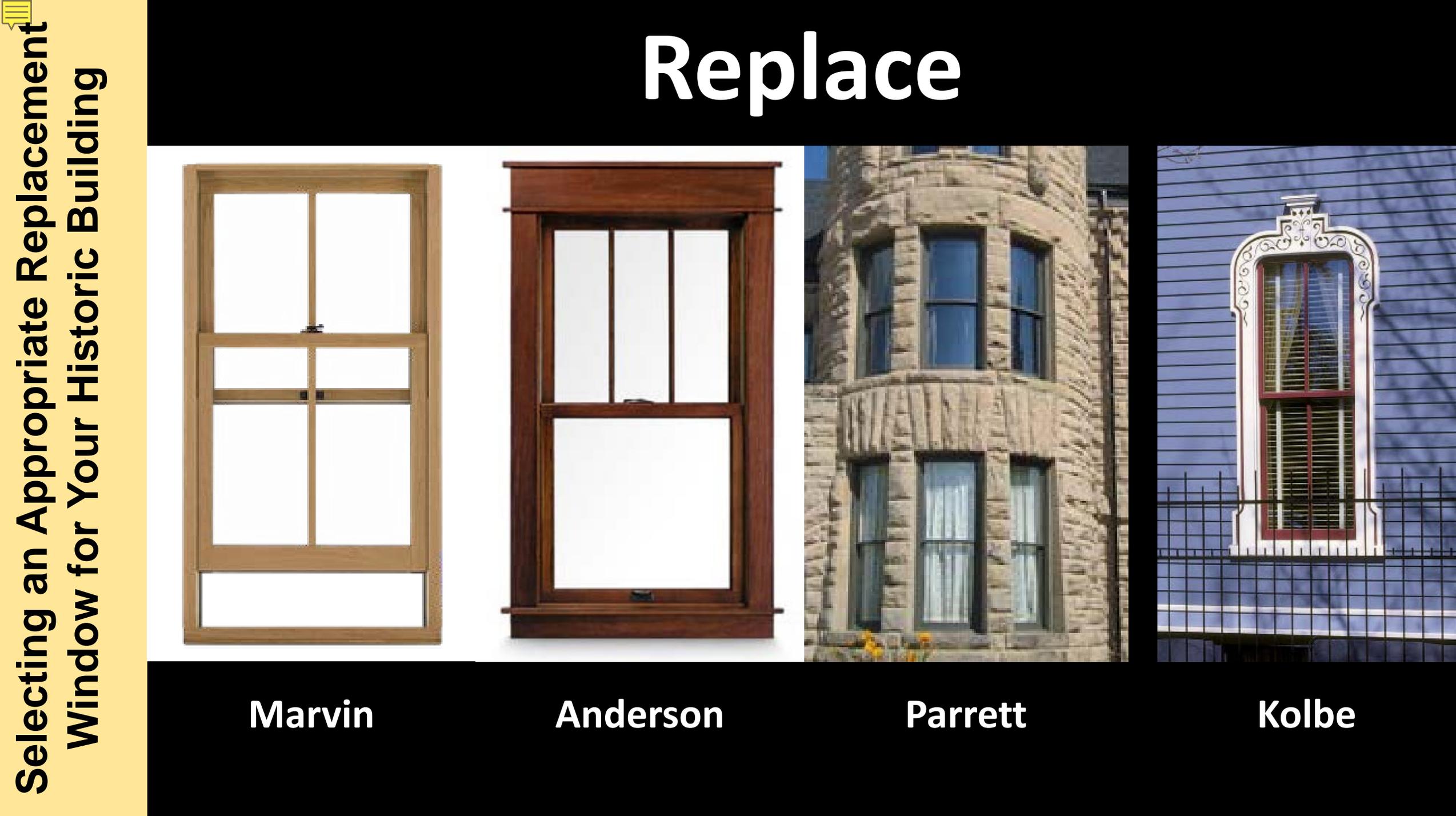
rocknrollz.com

PALACE MEETS
COWORKING

Selecting an Appropriate Replacement Window for Your Historic Building

Replace





Replace

Selecting an Appropriate Replacement Window for Your Historic Building



Marvin



Anderson



Parrett



Kolbe

Resources & Reading List

"13 Things You Should Know About Retrofitting Historic Windows." National Trust for Historic Preservation. January 19, 2016.

<https://savingplaces.org/stories/preservation-tips-tools-retrofitting-historic-windows#.X6Wv81qSk2x>

"Advantages of Maintaining Your Historic Windows." Wisconsin Historical Society.

<https://www.wisconsinhistory.org/Records/Article/CS4302>

Appropriate Methods of Reducing Lead-Paint Hazards in Housing

<http://www.nps.gov/hps/tps/briefs/brief37.htm>

Bridgeman, Michael. "Save Your Windows." Madison Trust for Historic Preservation. October 31, 2019.

<https://www.madisonpreservation.org/blog/2019/11/01/save-your-windows>

Exterior Paint Problems on Historic Wood Work

<http://www.nps.gov/history/hps/tps/briefs/brief10.htm>

Ferro, Maximilian. Preservation: Present Pathway to Fall River's Future. Fall River, Massachusetts: City of Fall River, 1979 (Chapter 7).

"Fixing Double-Hung Windows." Old House Journal (no. 12, 1979): 135.

"Historic Windows Repair & Thermal Upgrade." Montana State Historic Preservation Office; Montana Department of Environmental Quality; U.S. Department of Energy.

<https://mhs.mt.gov/Portals/11/shpo/docs/HistoricWindowRepair.pdf>

"Historic Wood Windows: Challenges and Opportunities." A program put together by Emily Wallrath Schmidt for the Chicago Bungalow Association and presented at Wisconsin Local History & Historic Preservation Conference, 2019.

<https://www.chicagobungalow.org/>

At Madison Trust website find "The Fix-it Guide": https://cf824c8d-00f3-4333-bcfb-47e1a3cb9f3d.filesusr.com/ugd/0ab238_4b515b8c1e6d4fa9b7ace68f97c61209.pdf

Improving Energy Efficiency in Historic Buildings

<http://www.nps.gov/history/hps/tps/briefs/brief03.htm>

InternNACHI's Standard Estimated Life Expectancy Chart for Homes. <http://www.nachi.org/life-expectancy.htm> ; 2013.

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

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.

Leeke, John, Preservation Consultant. "Managing Maintenance." Practical Restoration Report, Managing Maintenance, 1993. The report is available directly from Leeke. Write or call: RR1, Box 2947, Sanford, ME 04073; (207) 324-9597.

Leeke, John. Save America's Windows: Caring for older and historic wood windows. January 1, 2009.

<http://saveamericaswindows.com/>

Meany, Terry. Working Windows: A Guide To The Repair And Restoration Of Wood Windows. – April 15, 2008.

Morrison, Hugh. Early American Architecture. New York: Oxford University Press, 1952.

Myers, John H. "The Repair of Historic Wooden Windows." 9 Preservation Briefs, Technical Preservation Services, U.S. Department of the Interior, Washington, D.C., 1981.

National Park Service Preservation Briefs

<http://www.nps.gov/tps/how-to-preserve/briefs.htm>

Phillips, Morgan, and Selwyn, Judith. Epoxies for Wood Repairs in Historic Buildings.

Washington, DC: Technical Preservation Services, U.S. Department of the Interior (Government Printing Office, Stock No. 024016000951), 1978.

Preservation and Repair of Historic Stained and Leaded Glass

<http://www.nps.gov/history/hps/tps/briefs/brief33.htm>

Rehab Right. Oakland, California: City of Oakland Planning Department, 1978 (pp. 7883).

"Rehab Right Cost Calculator." Fort Collins Historic Preservation.

<https://www.fcgov.com/historicpreservation/costcalculator>

Save America's Windows

<http://saveamericaswindows.com/>

"Saving Windows, Saving Money: Evaluating the Energy Performance of Window Retrofit and Replacement." Resource Library, Preservation Leadership Forum, National Trust for Historic Preservation. March 11, 2016.

"Sealing Leaky Windows." Old House Journal (no. 1, 1973): 5.

"Selecting an Appropriate Replacement Window for Your Historic Building." Wisconsin Historical Society.

<https://www.wisconsinhistory.org/Records/Article/CS4308>

"Simple Steps to Working Windows." YouTube.

<https://www.youtube.com/watch?v=8ljbH0s1XRQ>

Smith, Baird M. "Preservation Briefs: 3 Conserving Energy in Historic Buildings." Washington, DC: Technical Preservation Services, U.S. Department of the Interior, 1978.

The Repair of Historic Wooden Windows

<http://www.nps.gov/hps/tps/briefs/brief09.htm>

Uploads from John Leeke. YouTube.

<https://www.youtube.com/playlist?list=UU4ExnCqTQwdocSeuj2Oza2A>

Weeks, Kay D. and David W. Look, "Preservation Briefs: 10 Exterior Paint Problems on Historic Woodwork." Washington, DC: Technical Preservation Services, U.S. Department of the Interior, 1982.

"Window Refurbishment & Repair – Contractors." Madison Trust for Historic Preservation.

<https://www.madisonpreservation.org/contractors>

Window repair tutorials

<http://www.thisoldhouse.com>

<http://www.oldhouseonline.com>

WOOD WINDOWS ASHRAE Handbook 1977 Fundamentals. New York: American Society of Heating, Refrigerating and AirConditioning Engineers, 1978 (chapter 26).

WINDOW CONTRACTORS and SUPPLIERS

Adam's Architectural Millwork Co.

<https://adamsarch.com/>

PRODUCT SUPPLIERS

Abatron, Inc. Wood Putty and Consolidant 5501 95 th Ave. Kenosha, WI 53144 (262) 653-2000

www.abatron.com

<https://www.bing.com/videos/search?q=abatron+wood+epoxy&view=detail&mid=91DAEF75267372128E3891DAEF75267372128E38&FORM=VIRE>

Architectural Resource Center (weather stripping) PO Box 217 557 Old Turnpike Road Northwood, NH 03261 (800) 370-8808

www.aresource.com

A&A Millwork Wood Storm Windows 3320 E. 41st Street Minneapolis, MN 55406

http://www.aamillwork.com/w_scr_win.htm

Allied Exterior Storm Windows 11111 Canal Road Cincinnati, OH 45241 (800) 445-5411

info@alliedwindow.com

Marvin Storm Windows John Bartram PO Box 1776 Billings, MT 59103 (406) 896-1756

jwbj45@msn.com

Weston Millwork Company

Second Era Millwork, 1870-1940

https://www.westonmillwork.com/american_millwork_catalogs

TOOL SUPPLIERS

Carpentry, Cabinetmaking Hand, and Power Tools Garrett Wade Co., Inc. 161 Avenue of the Americas New York, NY 10013 Telephone: (800) 221-2942; (212) 807-1155

www.garrettwade.com

Woodcraft 210 Wood County Industrial Park P.O. Box 1686 Parkersburg, WV 26102-1686 (800)

225-1153 www.woodcraft.com

Lee Valley Tools Ltd. P.O. Box 6295, Station J Ottawa, Ontario, K2A 1T4 (613) 596-0350

www.leevalley.com

McMaster-Carr Supply Company P.O. Box 440 New Brunswick, NJ 08903-0440 (201) 329-3200;

(201) 329-6666 www.mcmaster.com

Glaziers Tools Red Devil, Inc. 2400 Vauxhall Road Union, NJ 07083-1933 (800) 4 A Devil

www.reddevil.com

Embee Corporation 552 West State Street P.O. Box 788 Springfield, OH 45501 (513) 323-3795

www.embee.com

Fletcher-Terry Company 65 Spring Lane Farmington, CN 06032-3139 (800) 843-3826

www.fletcherterry.com

Hyde Tools 54 Eastford Road Southbridge, MA 01550 (508) 764-4344

www.hydetools.com



Wood Windows

Maintain or Replace

QUESTIONS

Window Conditions & Repairs Rating System		For homeowners interested in repairing their historic windows, this rating system was compiled based on skill level and material costs.					Check your state and local codes before starting any project. Neither the HCBA, any contributors or retailers can be held responsible for damages or injuries resulting from the use of the information in this document.	
Repair Level	Issue	Solution	DIY	Professional	Time	Material Cost	Resource	Notes
i. Basic	A. <i>Mold/Mildew</i> : Symptomatic of and encourages moisture retention, hazardous to health, prohibits operability	Clean mold/mildew with a heavy-duty cleaner or a mixture of detergent & water. Allow to dry and then sanitize with a bleach solution (1/4 c. bleach per gallon water).	✓	✓	15-30 min. per window	Bleach \$5; heavy duty cleaner: \$5-15	Any local hardware or grocery store, http://www.epa.gov/mold/cleanupguidelines.html	Non-porous materials such as solid wood can usually be easily cleaned of mold.
	B. <i>Missing Hardware</i> : Prevents the window from operating properly & conveniently, which can lead to deterioration	Seek replacement(s) that match original and install new hardware.	✓	✓	15 min. per window	Hardware ranges from \$2-25	Local hardware store, Rejuvenation, House of Antique Hardware, Kilian Hardware, thehardwarehut.com , architectural salvage	See Glossary for hardware types and descriptions
	C. <i>Squeaky Hardware</i> : A pulley, metal sash chain, meeting rail lock, or latch that squeaks or is difficult to operate	Apply "lube" like WD-40. Spray affected area, open & close the device several times to get it worked into the hardware and evenly applied. Repeat until it is easier to operate and no longer squeaks. Wipe excess.	✓	✓	5 min. per window	WD-40 \$5	Any local hardware store, Amazon.com, http://www.ehow.com/how_7857480_lubricate-oid-interior-door-hardware.html	Lubrication will only help if the hardware is clean and free of excess paint and rust. See Intermediate Conditions for a guide to over-painted and rusted hardware repairs.
	D. <i>Small Air Leaks</i> : These are small areas around the window where air drafts cause discomfort and energy loss.	<i>Weather-stripping</i> tape, felt and/or removable caulk are highly effective ways to temporarily reduce air infiltration around small gaps in windows. Feel for drafts at the perimeter and meeting rail. Follow packaging instructions for proper installation. If A/C units are left in place during colder months, be sure to cover any gaps to help reduce drafts.	✓	✓	15-30 min. per window	Foam weatherstrip tape \$5-15; removable caulk \$8-10; caulk gun \$10; A/C unit cover \$5-10	Any local hardware store, Amazon.com, http://www.acehardware.com/info/index.jsp?categoryid=1282811&backTo=3440730&savePath=2568443.2568451.2626208.2626341.2627448&infoType=infosport	Depending on the specific type, these forms of weatherstripping may be temporary solutions and will need to be replaced. Permanent weatherstripping options are addressed in Advanced Conditions below. It is best to remove and store A/C units in colder weather.
	E. <i>Over-paint on Glass</i> : Careless and sloppy painting make windows look dirty and unfinished.	Use window cleaner or dish soap solution and a straight edge blade to carefully scrape old paint off of the glass.	✓	✓	5-15 min. per window	Window cleaning solution \$3-10; Utility Blade \$3	Any local hardware store, http://www.freewindowcleaningtips.com/paintremoval.htm	Be very careful to lay the straight edge blade flush with the glass so as not to scratch the glass. Never scrape with a dry blade: always scrape a wet/slippery surface.
	F. <i>Storm Window Check</i> : Without proper maintenance, a <i>storm window's</i> efficiency can be greatly diminished and may allow or cause damage to the primary window frame.	Be sure that storm windows are properly closed and caulked around the exterior perimeter. The storm window <i>weep</i> s (small holes at the sill) and the space between the window and storm should be clear of dirt, debris, and caulk in order to properly vent and discharge moisture.	✓	✓	30-45 min. per window	Caulk \$8-10; Caulk gun \$10	Any local hardware store, Amazon.com, http://www.thisoldhouse.com/toh/article/0,,476717,00.html	If there are no storm windows or the existing storms do not function properly, see Advanced Conditions for a guide to finding new storm windows or repairing damaged storm windows.

Repair Level	Issue	Solution	DIY	Professional	Time	Material Cost	Resource	Notes
2. Intermediate	A. <i>Flaking Paint</i> : Painted windows may be <i>alligatoring, chipped</i> or <i>flaking</i> , which can cause dirt and debris and leave the wood beneath vulnerable to moisture damage.	Wear a dust mask, eye protection and work gloves. Use a paint scraper to chip off and remove any loose or flaking paint. Sand using medium grit, then fine grit to even out areas. Wipe <i>sash</i> clean of all dust and debris and prime with a thin coat of paint. Once dry, apply a thin top-coat of finish color.	✓	✓	1-2 hours per window	paint scraper \$3-10; sand paper \$5-10; qt. of oil-based paint \$20-30; qt. water based paint \$15-30; paint brush \$5-15; lead paint test kit \$20-40	Any local hardware store, Amazon.com, specialty paint store, etc. http://www.acehardware.com/info/index.jsp?categoryid=1284544 ; http://www.epa.gov/lead/pubs/renovation.htm	*Any building constructed prior to 1978 is likely to contain <i>lead paint</i> . Please take proper safety precautions when removing lead-containing paint finishes. If the repair areas are small, this can be done with the window in place. However, if the entire <i>sash</i> needs to be refinished, it should be removed for best results. See Advanced Conditions below for over painted woodwork repairs.
	B. <i>Sashes Painted Shut, Not Locking</i> : A window may be painted, caulked, or sometimes even screwed or nailed shut. This makes the window inoperable and often times has been done without closing the window properly beforehand. This may prevent it from locking and cause air and moisture infiltration.	Use a utility knife to cut paint at seams or remove caulk where sash may have been fixed. This most commonly occurs at the perimeter of the top sash. Check that the sash moves up and down so that the window may close properly and lock securely. Use fine grit sand paper to smooth cut edges and touch up with paint for a finished look.	✓	✓	15-30 min. per window	utility blade \$3-5; sand paper \$5-10; window-opener saw \$5-10	Any local hardware store, http://www.thisoldhouse.com/toh/video/0,,20053941,00.html	If the <i>sash</i> are painted shut but locking properly, there may be no need to free them; consider their daily, seasonal and emergency uses. Be aware that hidden conditions may arise once the sash is free. If the sash are nailed or screwed shut, refer to Advanced Conditions below for damaged woodwork repairs.
	C. <i>Over-painted or Rusted Hardware</i> : Too many layers of paint can make window hardware hard to use. Hardware may also be dirty and deteriorating due to the presence of rust.	For over-painted hardware, carefully remove from the window. Line a crock-pot with aluminum foil and immerse hardware in a solution of water and a couple tbsps liquid laundry detergent. Heat on medium and let soak for 1 day and remove paint with a nylon brush. Polish or finish as desired. For more stubborn paint, soak in a chemical stripper. If the hardware has rusted, clean with a rust removal product, wash, dry and refinish as desired. Mild rust may be removed by soaking hardware in vinegar and scrubbing with a nylon brush.	✓	✓	2 hours - 1 day, vinegar method may take from 10 minutes to overnight	Liquid laundry detergent \$10; quart. chemical stripper \$5-15; rust remover \$10-15; beeswax furniture polish \$10; metal polish \$10	Any local hardware store, Amazon.com, specialty paint store, auto body supply store, http://www.thisoldhouse.com/toh/how-to/intro/0,,20055784,00.html ; http://www.epa.gov/lead/pubs/renovation.htm	When using a chemical stripper, always protect your hands, skin and eyes. Work in a well ventilated space and follow manufacturer's instructions and proper disposal practices. Follow manufacturer's instructions for wait time and safety. If the hardware has several coats of paint and is rusting, it can also be sandblasted and professionally refinished.

Repair Level	Issue	Solution	DIV	Professional	Time	Material Cost	Resource	Notes
3. Advanced	A. <i>Broken Glass & Flaking Glazing Putty</i> : A cracked or broken pane of glass is insecure and unsightly. Flaking or missing glazing putty causes dirt and debris, makes the glass more susceptible to breakage and exposes the wood sash to water.	Chip out old glazing putty with putty knife or use a heat gun to soften and remove putty (cover unbroken glass with aluminum foil to prevent cracking from intense heat). Remove glazing points and broken glass. Paint glazing channel and reinstall new glass and points. Knead new glazing putty with hands to soften, and apply to glazing channels. Remove excess with a putty knife, shaping to a smooth bevel, and allow to dry. Paint putty bevel with a thin finish coat to match the sash.	✓	✓	1-3 hours per window plus 1 day drying time for the glazing putty prior to painting	Putty knife/paint scraper \$3-\$10; heat gun \$20-40; glazing points (depending on quantity in packet) \$10-30; push mate for glazing points \$10; 1 pint of glazing putty \$5-10; aluminum foil \$5; *regular glass 32" x 30" \$32; *obscure glass 28" x 30" \$70	Any local hardware store, Amazon.com, Torstenson Glass Co., Evanston Glass, LaSalle Glass & Mirror, Economy Glass Co., etc. http://www.thisoldhouse.com/toh/how-to/intro/0,,20052038,00.html	When removing glass and reglazing a window, it is best to remove the entire sash. This requires that the interior stops be removed and the weights detached. Any broken glass should be replaced in kind, as something different may cause the sash to weigh more or less than before and become improperly balanced. *Glass prices vary depending on composition, thickness and size.
	B. <i>Missing or Damaged Sash Cords/Chains</i> : This prevents a smooth window operation and is unsightly.	Remove the interior stops and pull the sash out from the frame, detaching any cords or chains from the sash. Carefully release the cord and allow the weight to fall to the bottom of the weight pocket. Open the weight pockets. Feed new cord or chain into pocket from pulley above and attach to weight. Adjust to necessary length and attach to sash. Check for smooth operation and make necessary adjustments. Close weight pocket and reinstall interior stops.	✓	✓	1-2 hours per window	Cotton sash cord \$5-15; solid brass sash chain \$3-4 per linear foot; sash weights \$4 per pound	Local hardware store, Rejuvenation, House of Antique Hardware, Killian Hardware, architectural salvage, http://www.thisoldhouse.com/toh/video/0,,1631564,00.html	If the sash chains have been painted, they might be salvageable. Refer to paint removal techniques listed in Intermediate Conditions above.
	C. <i>No Storm Windows</i> : If the storm windows are in poor condition or there are no storm windows at all, new storms will provide an extra insulating layer and protect your window from weathering due to wind, rain, snow and sun.	When ordering new storms, there are many considerations. Refer to our Storm Window Guide to see which option may be best for your windows.		✓	N/A	Refer to Storm Window Guide	Refer to Storm Window Guide, http://www.thisoldhouse.com/toh/article/0,,476717,00.html	Refer to Basic Conditions above for information on storm window maintenance.
	D. <i>Rattling, Racking Sash & Air Leaks</i> : If there are large gaps around the window sash, this can cause them to rattle in the wind, lift unevenly and stick when opened. Air leaks also cause energy loss and discomfort.	The gap between the sash and the jamb is best sealed with a permanent metal weather-stripping. This should be applied to the perimeter and meeting rail of the window and may require slight modification to the wood sash to accept the new weather-stripping. Once this is installed, slight adjustments can be made to make sure the sash fits securely in the opening.		✓	30-90 mins per window	Interlocking metal weather-strip \$2-4.50 per linear foot; Spring Bronze weather-strip \$1-1.50 per linear foot	Killian Hardware, Accurate Metal Weatherstrip Co., Dorbin Weatherstrip, http://www.oldhousejournal.com/magazine/1562	If permanent weather-stripping is not desired, other adjustments to the interior stops or sash may decrease the amount of rattling. Refer to Basic Conditions above for temporary weather-stripping repairs.

Repair Level	Issue	Solution	DIY	Professional	Time	Material Cost	Resource	Notes
3. Advanced (Continued)	E. <i>Over-painted Woodwork</i> : Layers and layers of paint build-up can decrease the ease of window operability and make them stick. It also gives them a muddy and dirty appearance by reducing the fine lines of historic wood windows.	When there are many layers of paint, it can take a lot of time and effort to hand strip with heat or chemicals. To save time and effort, most professionals will dip the entire sash in a chemical stripper to remove paint. Complete stripping and refinishing is an extensive DIY project, one reserved for the most patient and committed homeowners.	✓	✓	By Hand: 1-2 day per window; Dip Strip: 1/2 1 day per window	Paint scrapers \$3-10; sand paper \$5-10; qt of oil-based paint \$20-30, qt. water based paint \$15-30; paint brush \$5-15; chemical paint stripper \$5-40 per container; lead paint test kit \$20-40; *Use our Window Repair Resource Guide to contact professionals for an individual quote	Any hardware or home improvement store, amazon.com, specialty paint store; http://www.epa.gov/lead/pubs/renovation.htm	*Any building constructed prior to 1978 is likely to contain lead paint. Please take proper safety precautions when removing lead-containing paint finishes. When stripping and refinishing windows, it is best to remove the entire sash from the frame. This requires that the interior stops be removed and the weights detached. Wear a dust mask, eye protection and work gloves when doing this work. Work in a well ventilated space and follow manufacturer's instructions and proper disposal practices.
	F. <i>Missing or Damaged Woodwork</i> : Any number of things may have caused damage to the sash and woodwork. The joints may be separating, pieces of trim may be missing or warped, and there may be gaps or holes. All of these issues decrease the operability of the window and can let in drafts.	If a piece of trim or sections of millwork are missing, an experienced carpenter can mill a new piece to match. Some elements may need to be deconstructed and reconstructed using better fasteners or wood glues. Woodwork can also be filled or patched in areas where there are holes or chips.		✓	30 mins to 1 day per window	New interior stop \$0.66 per linear foot; exterior brick molding \$2 per linear foot; window casing \$1 per linear foot; new interior sill and apron \$6 per linear foot; new exterior sill \$5 per linear foot; wood filler \$5-10; *Use our Window Repair Resource Guide to contact professionals for an individual quote	Any home improvement store or lumber yard	
	G. <i>Water Damage, Infiltration or Rot</i> : If there is water damage or rot in the window, this is usually a sign of larger water management problems. If wet wood is not allowed to dry out, it will begin to rot and damage other areas of your window and frame.	When dealing with water damage, it is important to call a professional. They can help determine where the water is coming from and how it can be stopped. If the wood is only damaged, it can be salvaged and refinished. If there is rot, an experienced carpenter may be able to cut out the damaged area and either apply an epoxy or wood filler or install a "Dutchman" patch repair. Each case is different and entire pieces or elements may need to be replaced depending on the level and extent of damage.		✓	Time varies depending on condition	New interior stop \$0.66 per linear foot; exterior brick molding \$2 per linear foot; window casing \$1 per linear foot; new interior sill and apron \$6 per linear foot; new exterior sill \$5 per linear foot; wood filler \$5-10; *Use our Window Repair Resource Guide to contact professionals for an individual quote	Any home improvement store or lumber yard, http://www.thisoldhouse.com/toh/askto/question/0,,354386,00.html	