

HISTORIC PRESERVATION AND WEATHERIZATION

A PROPERTY OWNER'S GUIDE TO ENERGY EFFICIENCY

NEW YORK STATE'S HISTORIC BUILDINGS WERE ORIGINALLY DESIGNED AND BUILT WITH DISTINCT ARCHITECTURAL FEATURES AND DURABLE MATERIALS, THESE ARE ASSETS WHICH SHOULD BE CONSIDERED WHEN PLANNING ENERGY EFFICIENCY UPGRADES.

The New York State Historic Preservation Office (SHPO) is part of the Division for Historic Preservation in the Office of Parks, Recreation and Historic Preservation. The SHPO helps preserve the state's heritage through a variety of public programs authorized under the State and National Historic Preservation Acts. These include federal historic rehabilitation tax incentives, State and National Registers of Historic Places, Certified Local Government (CLG) Program, historic resources surveys, grants, environmental review, archeology, and education. Staff provide technical preservation advice to owners of historically and culturally significant properties.

WEATHERIZATION & HISTORIC BUILDINGS

Before 1950, builders relied on durable, natural materials and used architectural features that were designed to counter the effects of seasonal change. For example, roof overhangs and open decorative porches provide shade; operable windows and doors allow for day-lighting and natural ventilation; wood windows, siding and trim were fabricated from dense, old growth species that resist rot, and many components were built to allow simple repair.

Basic maintenance procedures can help retain historic materials and features. When properly cared for, historic materials can outlast many modern replacement materials. Take a holistic look when assessing how best to approach your project, and take the time to understand the many factors associated with your building.

One size does *not* fit all

Any rehabilitation or energy efficiency project will be most effective if it is tailored to the original design, construction and condition of your particular building. An energy audit will create a roadmap for your project. You can then identify your energy saving goals and determine a budget for both short- and long-term solutions.

Considerations for historic properties

In general, building owners should strive to retain and repair original and historic materials which contribute to the distinct character of a property. If your building is listed on or eligible for either the State or National Registers of Historic Places, SHPO staff will work with you to determine the best approaches to weatherization objectives so that the historic status of the property is not compromised. It is useful to refer to the *Secretary of the Interior's Standards for Rehabilitation*, available from the National Park Service. However, even if your building is not eligible or listed, this guide offers information for working with historic building materials. It will help you focus on what is important as you inspect your home.

ENERGY AUDIT

Your house is comprised of many elements which work together to provide shelter. Over time, such elements tend to deteriorate and move apart due to changes in structural loading, climate, and moisture conditions. The leading cause of high heating and cooling bills is air infiltration. In order to identify the location of air leaks, one should hire a professional to



Weatherization projects can improve the energy efficiency of all types of buildings such as the single family home in Utica (top) and the large apartment building along the Grand Concourse in the Bronx (bottom).



DIVISION FOR HISTORIC PRESERVATION

NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION

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conduct an energy audit. The audit will review your past energy bills and conduct an assessment of actual conditions using a blower door test. The findings will provide the baseline information you will use as you determine how to improve the performance of your historic house in a way that is cost effective and avoids damaging historic features.

Who conducts the audit?

Building audits should be performed by certified contractors. You can find them through The New York State Energy Research and Development Authority (NYSERDA) office, your local utility company or your local historic preservation organization (see resources on page four). Ideally, you should try to work with someone who will have no financial interest in the outcome of any audit.

Common findings of an audit

Since no two buildings are alike, the following is intended to be a general checklist of problem areas.

Air Infiltration. Heat loss occurs around doors and windows and through cracks in the building envelope. Some air infiltration is healthy, but too much can lead to wasted energy.

Windows and Doors. Despite the fact that they get a bad rap, windows account for only 5-10% of energy lost, primarily by air infiltration. The average window replacement lasts only 20 years. The most cost effective solution to reducing air infiltration is to add weather-stripping to doors and windows. This low-cost solution can be purchased at a local hardware store and installed using few or no tools.

Interior Elements. Install gaskets around switch plates and electrical outlets. Check baseboard and trim locations for gaps between the walls.

Utility Entrances. Install caulk around cable and fuel lines where they meet the exterior wall. Install caulk at the rim joist of your basement.

Chimney and Fireplace. About 14% of air escapes from the house through the fireplace. Be sure to close the damper when the fireplace is not in use.

Doors. Install door sweeps on the bottom of your doors to lock out cold air.

Heating, Ventilation and Air Conditioning (HVAC). Be sure that your equipment is working as efficiently as possible. The energy audit will determine the age of your system, its efficiency, and if it is properly sized for your building and your lifestyle. If you need to select a new system, consider how its installation will impact the building's historic fabric and ask your local preservation experts for guidance.

Insulation. Over 30% of heat loss occurs through your roof! Adding a new layer of attic insulation can reduce that heat loss significantly. Your audit will determine the type of insulation that exists, if any, and if your exterior wall and attic framing are good candidates for receiving new insulation. **Caution**—Walls may contain knob and tube wiring. If this still exists, it must be removed prior to adding insulation. Also note, some types of existing insulation, such as vermiculite, may contain asbestos which is hazardous.

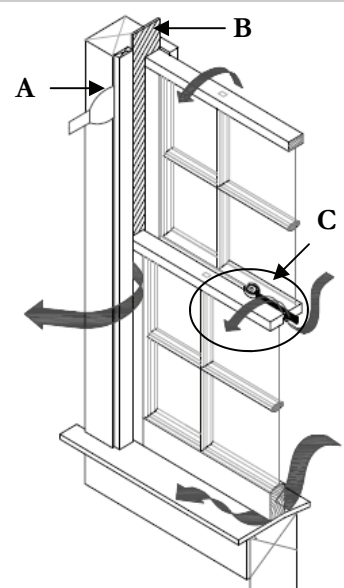
Attic. Install insulation in the attic floor and over the attic hatch. When installing fiberglass or cellulose insulation, place a moisture barrier on the warm side of the thermal envelope.

Since liquid foam insulation will adhere permanently to wood and masonry fabric, its use is not advised for historic buildings.

Attic vents need to be clear for proper air movement and drying. If you must install new attic vents in the gable end, consider how this will alter the historic appearance of your building and avoid irreversible changes.

Summer Cooling. Install window and door screens during the warmer months. Close windows and curtains to reduce solar gain during the day, and open the windows overnight to draw in cooler air. If you have double hung windows, open both the bottom and top sashes to increase the cycle of cool and warm air.

Arrows indicate where air infiltration occurs most often



A Weather-stripping should be installed at the jambs, the sill, the head and at the meeting rails. Use a thin putty knife to slip behind the stop and lightly pry off. This will allow you to remove the sash and install spring bronze.

B Spring bronze is a good choice for the jambs. The strip is nailed to the jamb channel along the interior side at the stop or parting bead.

C An interlocking strip is best for the meeting rails. When the window is closed, the strips close off any air gaps. The sash lock pulls the meeting rails tight.



Tools for window maintenance include those readily at hand

Windows. Avoid replacing historic windows with new windows. Replacement windows are often expensive, have a limited life span, and can irrevocably change the character of a historic house. The key to successful planning for window maintenance is to consider the needs of each window. You do not need to take the same action for all the windows in the building.

For example, you might carefully restore the front windows and add interior storm panels in the winter months. Along the side elevations, weather-stripping and exterior storm windows may suffice. If the rear elevation has undergone multiple modifications over the years, then replacement windows may be appropriate in this area.

During the audit process, it is best to undertake a survey of your windows and doors. Rate their physical condition (poor, fair, good, excellent), note missing elements such as broken cords or panes of glass, the ease of operation, and integrity of the paint. A survey will help you quantify the type and amount of work, estimate costs, identify priorities, and establish a plan of action.

WINDOWS: COMMON PROBLEMS

Common problems associated with old windows which can be easily repaired include:

- Sticky Windows / Loose Windows
- Replacing Glazing and Putty
- Sash Cords and Weights
- Cracked Paint - If your home was built prior to 1978, trim and window elements will likely contain lead paint. See the Environmental Protection Agency website: www.epa.gov/lead/pubs/renovation.htm.

Storm Windows—Exterior & Interior

If your windows are in reasonable condition, extra glazing can be added by installing storm windows, either on the interior or the exterior. Storm windows provide a thermal barrier that prevents both heat from within being lost and cold from without being allowed in. Some studies show a 50% improvement in reducing energy loss. Storm windows are a very cost-effective way to save energy dollars.

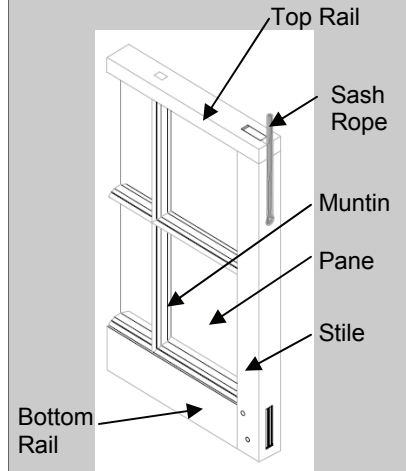
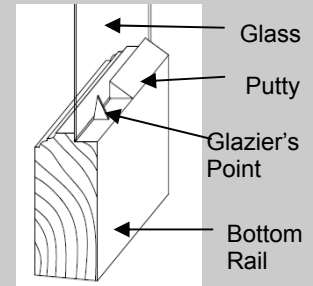
Not only do storm windows create an insulating air gap, they are also effective in sound reduction, protect historic building fabric, and limit UV light which can fade fabrics and damage other valuable materials. Storm window panels can be made of glass, plastic or even plastic film; frame materials can be wood, aluminum/steel and vinyl. If you own existing storm windows, they can be cleaned and re-weatherized. New storm windows can be retrofitted or built using old growth wood and glass from your local parts warehouse or salvage yard.

Replacement Windows

The retention of original or existing windows is most desirable, however, the completely deteriorated condition of a window clearly indicates replacement. The selection of replacement windows should begin with a study of the windows which are being replaced. Try to understand what your windows contribute to the appearance of your house including:

- Pattern of the openings and their size, shapes and decorative details
- Proportions of the frame to sash
- Configuration of window panes and muntin profiles
- Material, including type of wood or metal and glass characteristics.

Top & Bottom Sash Terms



Replacement Window Dos & Don'ts



Existing A



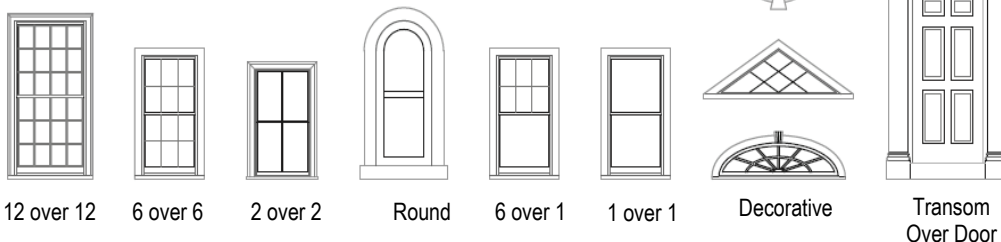
Existing B



Existing C

- A: Replacement of 6 over 6 in kind, keeping muntin pattern and size.
- B: Replacement with 1 over 1: Poor selection, no muntins change the design substantially and reduce the overall character of original windows and building.
- C: Replacement with smaller opening: Poor selection, wrong size and proportion to overall wall

Windows common to historic buildings found throughout New York

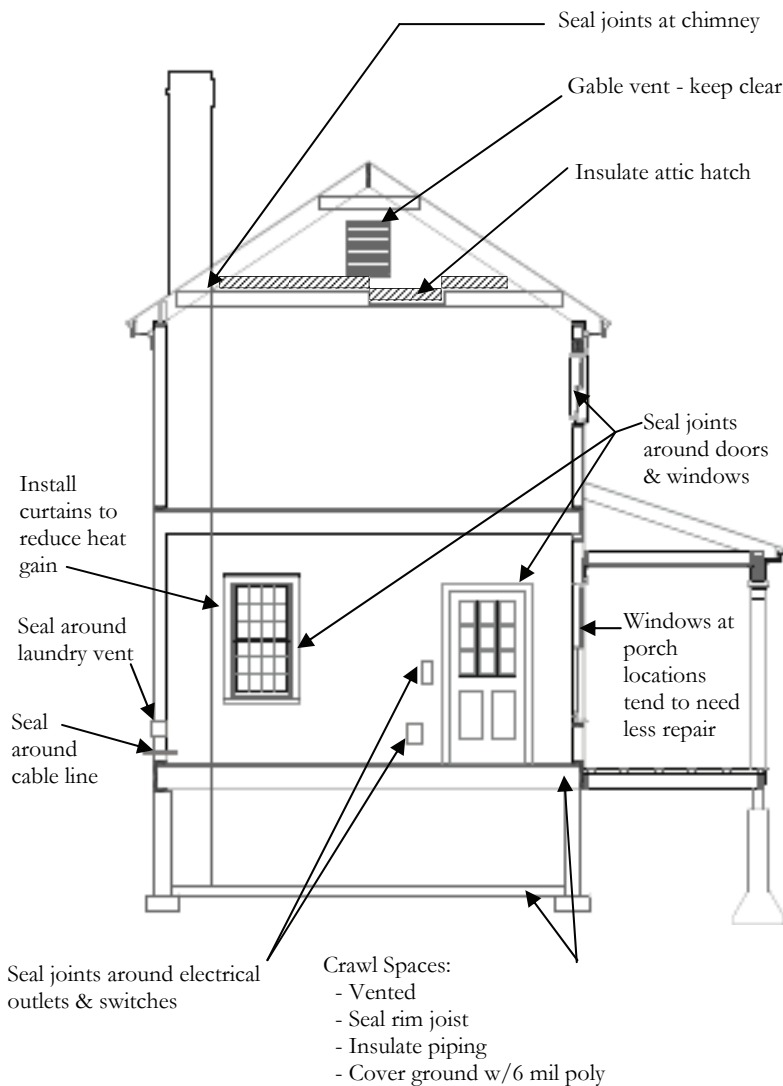


Once you have an understanding of the significance of your windows, search for a replacement type that retains as much of the historic character as possible. You may want to seek alternative sources to the big box home improvement stores, including historic preservation organizations, historic parts warehouses, restoration carpenters and other woodworking professionals.

While it is best to replace in-kind, there are substitute materials which can be employed to mimic your original windows. Again, wholesale replacement of all windows in a building is not always the best approach.

For more information about other programs for your historic building, please visit our website at www.nysparks.com/shpo.

EXTERIOR BUILDING ENVELOPE
AIR INFILTRATION & INSULATION



STATE AND FEDERAL RESOURCES

NYS Division for Historic Preservation (see below), Weatherization, historic preservation and tax credit programs.

NYS Energy Research Development Agency (NYSERDA), 866-697-3732 or 518-862-1090. www.nyserdera.org Incentive programs and assistance for property owners. www.energystar.gov

National Park Service, Technical Preservation Services
www.nps.gov/history/hps/tps/weather/index.html
Publications on all aspects of maintenance and repair of historic materials, including energy efficiency, wood and metal window repair, and lead paint issues: www.nps.gov/history/hps/tps/topics/index.htm

NON PROFIT ORGANIZATIONS

Adirondack Architectural Heritage, 518-834-9328
www.aarch.org

Historic Albany Foundation, 518-465-0876
www.historic-albany.org

Landmark Society of Western New York, 585-546-7029 www.landmarksociety.org
LSWNY's *Rehab Rochester* is a publication that offers extensive guidance for repairs.

The National Trust for Historic Preservation
www.preservationnation.org/issues/weatherization/

New York Landmarks Conservancy, 212-995-5260
www.nylandmarks.org The NYLC has published *Repairing Old and Historic Windows*.

Preservation League of New York State, 518-462-5658 www.preservenys.org Staff can provide more information about local resources

Preservation Buffalo-Niagara, 716-852-3300
www.preservationbuffaloniagara.org

Society for the Preservation of Long Island Antiquities, 631-692-4664; www.splia.org

Illustrations: Eric N. Kuchar, SHPO

Division for Historic Preservation
NYS Office of Parks, Recreation & Historic Preservation

Peebles Island, P.O. Box 189

Waterford, NY 12188-0189

518.237.8643 www.nysparks.com/shpo

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