

WINDOWS AND DOORS

The Least You Need to Know:

- Windows and Doors are character-defining elements of all buildings.
- Do not replace historic windows and doors solely to improve energy efficiency.
- Air infiltration around windows and doors is often caused by missing or deteriorated weather-stripping, caulking or loose glazing around glass.
- Well maintained windows and doors can be energy efficient too.

The Significance of Windows and Doors

Windows and doors are among the most prominent features of buildings.

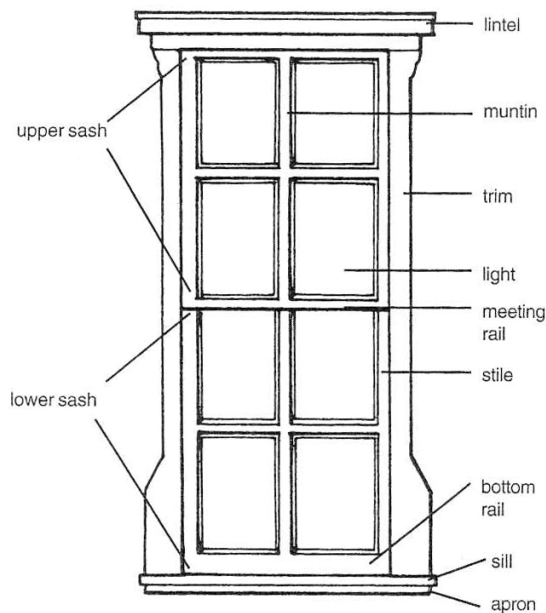
Windows typically comprise about 20 to 30 percent of a historic building's surface area, and they act as both interior and exterior elements. Historic doors often use size and detailing to draw attention to the entrance.

Significant parts of doors and windows include their materials and shape, panel and pane arrangement, moldings, hoods, fanlights, and sidelights.

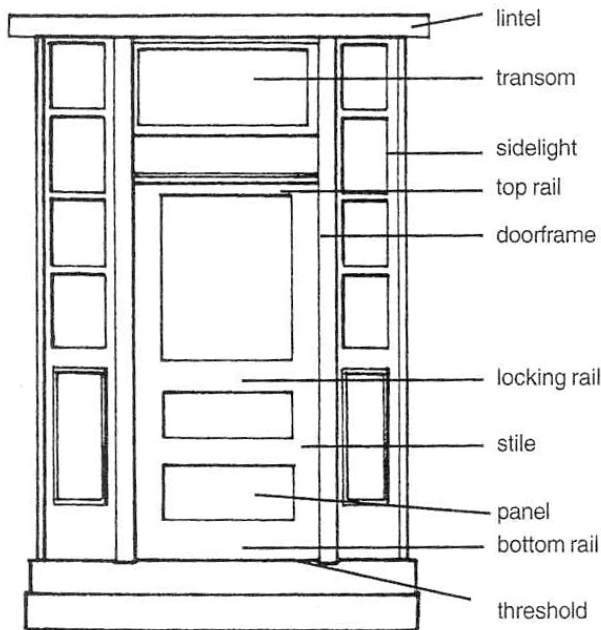
Windows and doors receive consistently hard use, but they are so thoroughly integrated into the structure of a house that complete replacement is rarely advisable. Repair and weatherization are often more practical and economical than most property owners realize.

Windows are typically composed of sash in a frame with surrounding trim.

Shutters were used historically for insulation. They closed over window and door openings to keep the wind and sun out. Shutters are rarely used for this purpose today, but on a historic building they should still appear functional.



WINDOWS AND DOORS



Doors are typically composed of panels and rails that are placed in frames. Doors are often combined with transoms and sidelights to create a more elaborate doorway.



Window and Door Repair

The options for repairing, rehabilitating, and replacing historic wood windows and doors directly relate to the degree of deterioration present.

Undertake routine maintenance on windows and doors. This may include replacement of broken panes, repair of sash cords, removal and reapplication of caulking, putty, and weatherstripping, and scraping, sanding, priming, and repainting.

Repair decayed parts in place. If wood is badly rotted, treat with fungicide, saturate with linseed oil, fill cracks and holes with putty, consolidate with epoxy or patching compound, sand, prime, and paint.

Without replacing the entire unit, replace parts of the frame and sash or door by patching, splicing, and piecing in. (Using surviving parts as models, choose replacement parts that match the original in size, shape, material, and all detailing. If a majority of a member is deteriorated, replace the entire member using the old one as a pattern for the new.

If a majority of the components of the window sash and frame, or door and door frame, require replacement, consider replacing the entire unit using the following guidelines.

WINDOWS AND DOORS

When to Replace Windows and Doors



Wood windows and doors are subject to deterioration from years of use, water accumulation, and insects. But, deteriorated wood windows and doors may look worse than they are. The most commonly affected areas, the sill and the lower rail, can often be restored without replacing the entire unit. In most cases, even if individual units are severely deteriorated, replacement of all the windows and doors in an historic building is seldom necessary and should be avoided. Often the decision to replace an entire window is due only to a rotted sill. In this case, full replacement is NOT necessary.

Signs that a Window or Door Needs Maintenance or Repair

- Broken sash cords
- Broken glass
- Peeling paint
- Loose putty
- Air infiltration
- Stuck sash

These conditions alone do not warrant replacement.



WINDOWS AND DOORS

Signs That a Window Should Be Replaced:

- The existing window cannot be made to fit tightly in the wall because of settlement or deterioration in the outside wall.
- Materials or skills required to repair the window are not available.
- Substantial parts of the window are missing or are so severely damaged that they must be replaced.

Caution: Removing window or door units for repair increases the likelihood of damage. Attempt to repair windows and doors in place.

Replacement Guidelines

When original windows are missing, replacements should be chosen based on historical, pictorial, or physical documentation. Avoid creating a false historic appearance due to insufficient documentation.

Check salvage yards, antique stores, demolition companies, and custom manufacturers for replacements. Be sure to reuse all serviceable historic hardware.

For multi-pane replacement windows, replacements that have panes of glass divided by muntins (strips of wood) are the best choice. Snap-in muntins, surface applied muntins, and muntins between panes of glass should be avoided. They are not convincing because they don't have enough depth to provide a shadow.

Picture windows, bay windows, and casement windows should be chosen as replacements only when these types are original to the building.

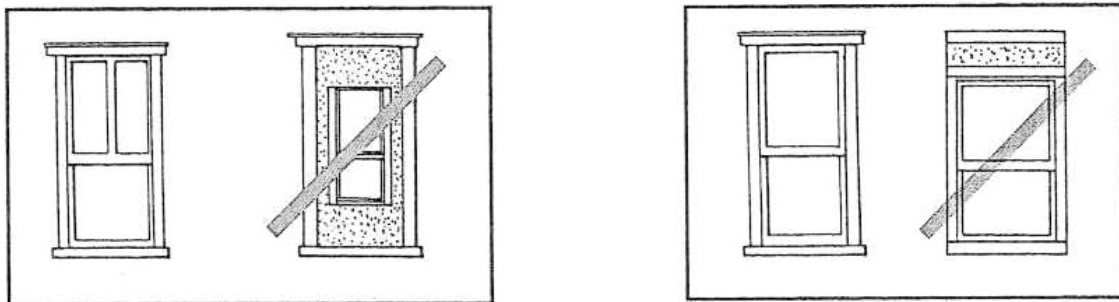
Steel-covered hollow core doors have a poor finished appearance and often do not come in sizes and styles that are appropriate for historic buildings.

WINDOWS AND DOORS

Choosing Replacements

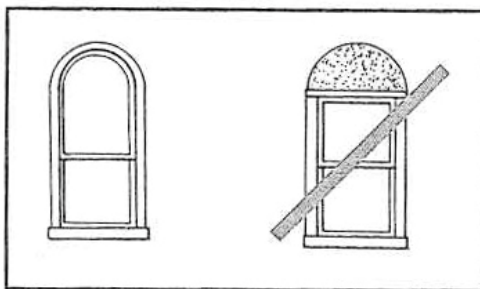
Once it has been determined that a window or door is beyond repair and must be replaced, the type of replacement unit must be chosen.

Overall Size

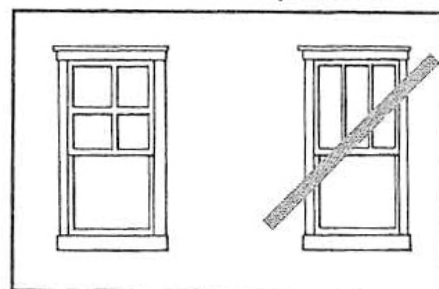


Choose replacement windows and doors that fit the original opening exactly and match the original units in material type, glass color and reflectivity, overall size, number of panes, shape, type of operation, arrangement of panes, decorative details, and component size (frames, muntins, etc.) Glazing should be single pane and muntins should be integral to the construction of the window (i.e. true divided light).

Shape

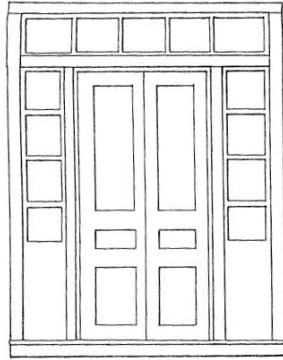


Number of panes

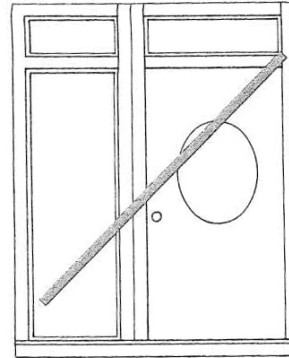


WINDOWS AND DOORS

Choose windows and doors of a comparable material and style that match all other design details of the original. Choose styles that are appropriate to the age of the building.



A historic entrance.



An incompatible modern entrance.

Increasing Energy Efficiency in Windows

Old windows should never be replaced solely for the purpose of improving energy efficiency. An old window that has been properly repaired and provided with a well-fitted storm sash will be as efficient as a new, double-glazed unit.

Remove and reapply caulking, putty, and weather-stripping. Tighten the interior lock on the meeting rail of double-hung windows to fit the window tightly against the frame and to decrease air infiltration. Refer to guidelines below.

Install properly designed and fitted storm units.

A Note about Energy Efficiency and Replacement Windows

Most people want to start weatherizing their buildings by replacing their windows. While making these upgrades can improve performance and reduce energy bills, the cost to your bank account and the environment are quite large in relation to the savings. The payback period is long – usually longer than the life of the replacement windows.

The average payback period for replacement windows has been calculated at 28 years with a typical lifespan of a replacement window calculated between 7 and 12 years.

WINDOWS AND DOORS

Storm Windows and Other Modern Treatments

Common triple track aluminum storm sash is acceptable. Some modern treatments for increasing the energy efficiency of windows, like "low-E" glass and the use of argon and krypton gas, may be appropriate for historic buildings. They are appropriate when they do not alter the character of the glass or the overall window from its historic appearance.

Weather-stripping and Caulking

Air can leak between a window's sash and frame, between window and door frames and the adjacent wall surface, and where sash rails meet. Weather-stripping fills cracks around doors and windows to provide a tight seal and to eliminate drafts. Caulking seals gaps between building materials to prevent air and water infiltration.

Storm windows are much more effective than storm doors. Storm doors and entrance vestibules are typically not cost effective. A properly weather-stripped door can outperform a door/storm door combination.

Guidelines for Storm Windows and Doors

- Wood storm frames are preferred. They can be fabricated to fit any opening and are much more energy efficient than aluminum or vinyl because wood conducts heat more slowly than those materials. Well maintained wooden storms can last over 100 years - much longer than aluminum.
- Storm units should completely fill the opening. Any divisions should match existing divisions in the primary unit. Aim to reveal as much of the original unit as possible.
- Storm units should match the shape of the window or door opening. If the opening is arched, the storm unit should be arched.
- Install storm units without damaging the original building fabric. Install caulking to ensure that moisture does not collect between the storm and the primary unit.
- Avoid storms with a natural aluminum finish. They should be painted to match window trim.

WINDOWS AND DOORS

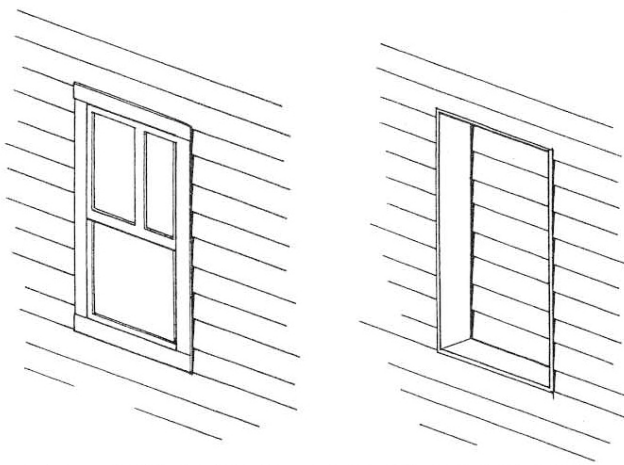
Making New Window and Door Openings

New window and door openings tend to destroy the rhythm and balance of historic buildings and their historic materials. For these reasons, creating a new opening is a last resort alteration, and new openings should never be added to the walls of buildings that are visible from the street.

Closing Window and Door Openings

Filling in historic window and door openings destroys the rhythm and balance of a building and destroys historic materials. This type of alteration is rarely appropriate.

Retain the historic window or door in place, with all its associated features. Add materials or treatments at the interior to make the units inaccessible and non-serviceable, while maintaining the external appearance. Painting glass black on the inside or adding other similar materials to achieve the same effect may be considered. Also consider installing shutters over windows and sealing doors.



A window opening filled with the material of the surrounding wall.

If the window or door must be removed, fill the opening with a material that is compatible in appearance to the wall facing material. Be sure that the surface of the infill material is recessed from the face of the wall, and the original size and shape of the opening are maintained. Retain as much detailing and ornament in place as possible. Save any removed historic materials for later use.

When are Shutters Appropriate?

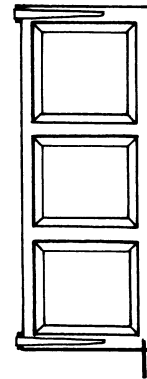
Shutters were not installed on all buildings, and should only be added to those historic buildings that did have them. Shutters were used on most Federal style buildings, and were less frequently used on Greek Revival, Italianate, and Queen Anne buildings. Look for holes near the top and bottom of your window frames, or faded silhouettes of shutters on

WINDOWS AND DOORS

your exterior walls, or shutter anchors on the wall near your windows. If this evidence exists, shutters may be appropriate for your building.

Shutter Guidelines:

- Shutters should be attached to the face of the window frame with hinges - not to the wall.
- Many buildings were fitted with paneled shutters at the first story and louvered shutters at the second story. Replacement shutters should duplicate this pattern.
- Retain ornamental anchors.
- Horizontal divisions of shutters should match those of the sash.
- New shutters should be made of wood.
- Shutters should match the window in height, shape and each shutter should cover $\frac{1}{2}$ the entire window opening.
- Shutters should be installed only if they were used historically.



WINDOWS AND DOORS

Awnings

In the first half of the 20th century, canvas awnings were often installed on new residences and were added to older residences. Awnings can enhance the appearance of a building and can be up to seven times more effective than drapes in controlling heat gain.

Guidelines for Awnings:

- The top of the awning should conform to the shape of the window or door opening.
- The awning should be contained within the opening.
- Awnings and their associated hardware should not damage or hide existing historic materials or features.
- Canvas or other flexible, natural materials are preferred. Rigid awnings should not be installed.



* Drawings used with permission from the Borough of Gettysburg.