



Township of Cheltenham

Board of Historical and Architectural Review

GUIDELINES FOR WOOD WINDOWS



This tripartite window configuration, with multi-light upper sashes and central arch-headed sash, is a character-defining, historic feature. A Certificate of Appropriateness application for changes to windows must be submitted for BHAR review prior to the commencement of work.

PURPOSE

These guidelines were prepared to assist property owners with information when considering the repair, replacement or installation of wood windows. They are not intended to replace consultation with qualified architects, contractors and the BHAR.

These *Guidelines* were developed in conjunction with the Cheltenham Township's Boards of Historical Architecture Review [BHARs]. The BHARs review Certificate of Appropriateness [COA] applications for proposed exterior alterations to properties within the historic districts that are visible from a public way. The applicant is responsible for complying with the provisions of the Zoning and Building Codes at the time of applications. The applicant must obtain a Certificate of Appropriateness [COA] as well as all necessary permits prior to proceeding with any work. For more information, or to obtain permit applications, please call the COA Administrator at [215] 887-6200 ext. 213.

Please review this information during the early stages of planning your project. Familiarity with this material can assist in moving a project quickly through the approval process, saving applicants both time and money.

WINDOWS

Windows typically comprise at least one quarter of the surface area of the exterior walls of most historic buildings. In terms of operation, windows provide access to natural light and ventilation for a building. In terms of appearance, they are an important design feature that helps to define the style and period of a building. Whether elaborate or simple, windows demonstrate both the history of the building and the history of the methods of manufacturing when they were created.

Windows, including their shutters, trim and associated features, are important elements of historic buildings because they can:

- Act as a welcoming transition from the building's exterior to the interior
- Act as the "eyes" of a building
- Provide natural light and ventilation
- Help define architectural style and building type
- Help date the age of construction
- Define the character of each individual building and provide a visual connection to the streetscape
- Contribute to the visual cohesiveness and architectural vocabulary of the surrounding area

DEFINITIONS

Glazing: Glass

Light: A pane of glass

Mullion: The vertical framing element separating two window or door frames

Multi-light: Having many glass panes, as a window or door

Muntin: The narrow molding separating individual panes of glass in a multi-paned window sash

Rail: Any of various horizontal members that frame panels of a window or door

Sash: The part of the window frame that holds the glazing, especially when movable

Simulated Divided Light [SDL]: A window or door in which muntins are applied to a larger piece of glass at the exterior, interior and/or between layers of insulated glass

Single-light: Having one glass pane, as a window or door

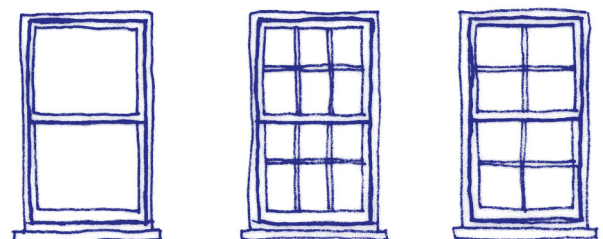
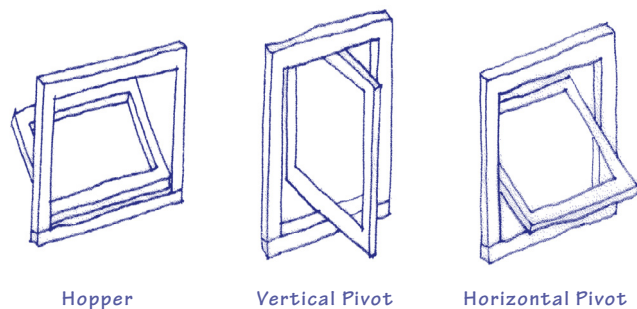
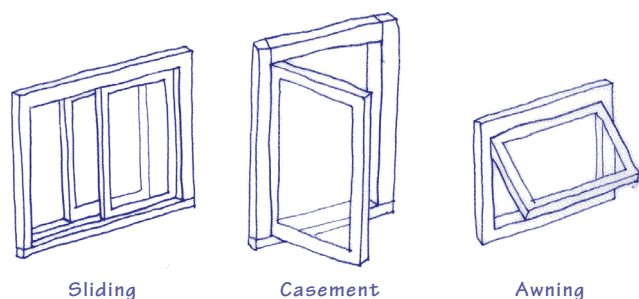
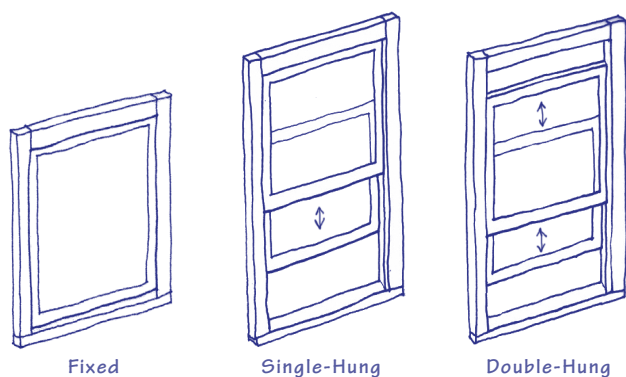
Stile: Any of the various members that frame panels of a window or door, typically vertical

True Divided Light: A window or door in which a glass area is divided into several small panes

COMMON WINDOW TYPES

All of the identified window types can have different muntin patterns or configurations. Muntin patterns are defined in terms of the number of panes or lights. (Refer to *Window Configurations* at right for additional information.)

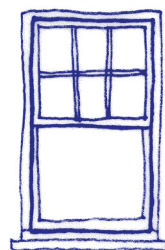
- **Fixed:** Non-operable framed glazing
- **Single-hung:** Fixed upper sash above a vertically rising lower sash
- **Double-hung:** Two sashes that can be raised and lowered vertically
- **Sliding:** Either a fixed panel with a horizontally sliding sash or overlapping horizontally sliding sash
- **Casement:** Hinged on one side, swinging in or out
- **Awning:** Hinged at the top and projecting out at an angle
- **Hopper:** Hinged at the bottom and projecting in at an angle
- **Vertical Pivot:** Pivots vertically along its central axis
- **Horizontal Pivot:** Pivots horizontally along its central axis



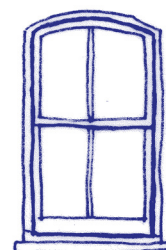
1/1 Window

6/6 Window

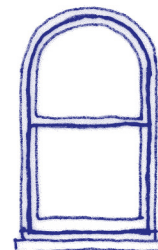
4/4 Window



6/1 Window



2/2 Window with
arched head



1/1 Window with
round head

WINDOW CONFIGURATIONS

Window patterns and configurations are intrinsically linked to a building's period of construction and architectural style. Older buildings, such as those built in the Federal period, typically have double-hung or casement windows with smaller panes of glass and more simplified detailing reflective of the materials and hand manufacturing processes readily available at that time. Late-19th century buildings, such as those from the Victorian period, often had windows of varying shapes with elaborate frames, casings, applied ornament and trim, and larger glass lights. Finally, Colonial Revival buildings of the early-20th century often reproduce aspects of the Federal style but might include larger lights.

Because all of the components and details of a window are essential to defining the construction period and style, the pattern and configuration of a proposed replacement window should be historically appropriate for each building. If considering a replacement window, it is important to keep in mind that altering the window type, style, shape, material, size, component dimension, muntin pattern or location can dramatically alter the appearance of the building.

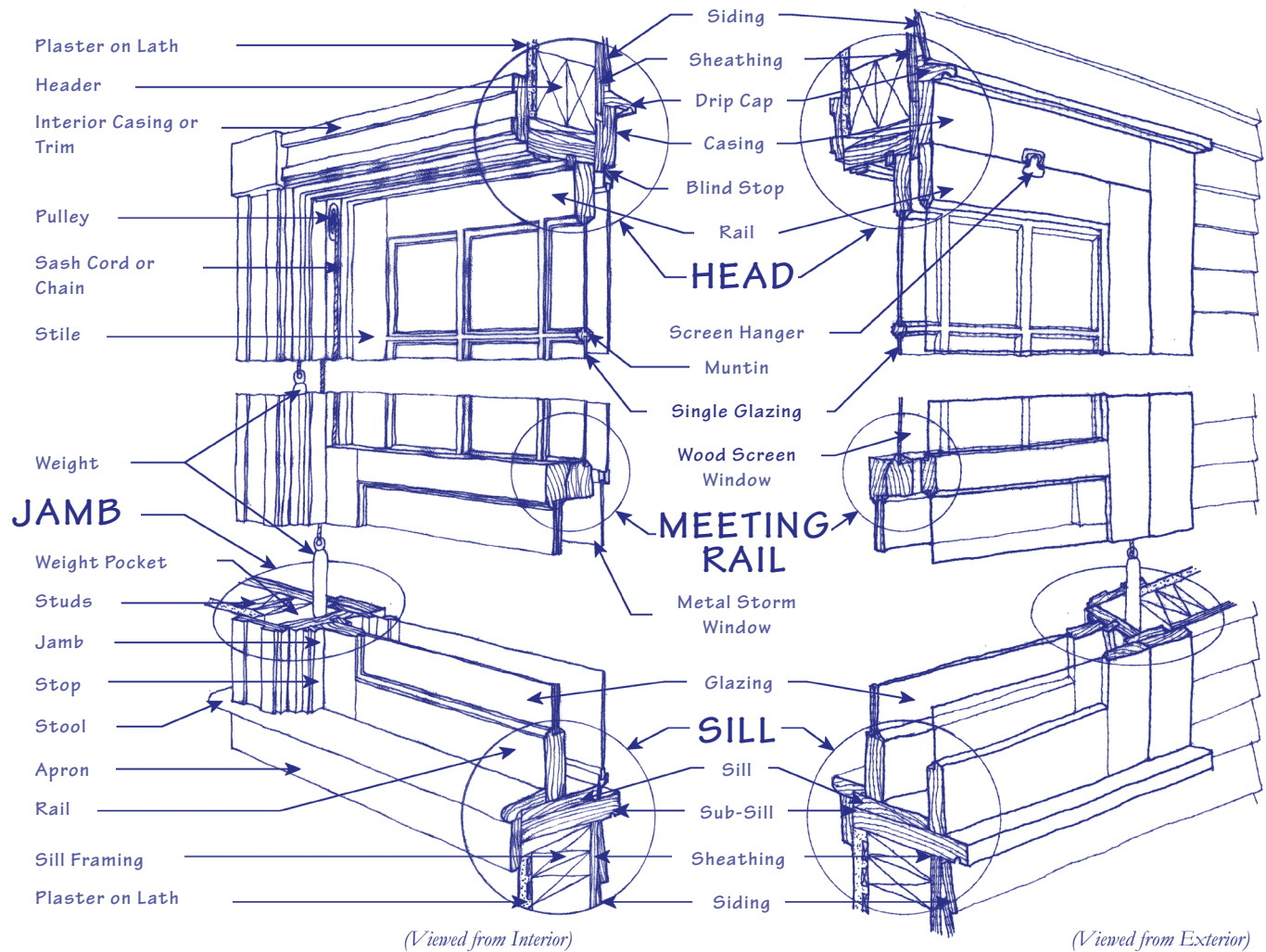
The BHAR encourages:

- Matching the historic window configuration
- Matching the historic, exterior muntin pattern, profile and size as closely as possible
- Matching the historic window operation
- Installing true divided-light windows rather than snap-in muntin grids when feasible

The BHAR discourages:

- Use of internal muntins between glazing layers
- Installing an inappropriate window type, such as a casement in a former double-hung window location or an operable window in place of a fixed transom.

DOUBLE-HUNG WINDOW COMPONENTS



HISTORIC WINDOW PROBLEM SOLVING

Property owners may not pay attention to their windows until a problem occurs. Typical concerns include operability, air infiltration, maintenance and appearance. Generally, the appearance of a window that has not been properly maintained can seem significantly worse than its actual condition. Replacement of an entire wood window because of a deteriorated component, typically the sill or bottom rail, is rarely necessary. In many instances, selective repair or replacement of damaged parts and the implementation of a regular maintenance program is all that is required. It is generally possible to repair windows in fair or good condition relatively economically.

Maintenance

- Regularly review condition, repair and repaint windows

To improve operation

- Verify that sash cords, chains and weights are functional — Install metal sliders or sash tape, balances or operators at jambs if repair is not practical
- Repair or replace deteriorated components such as parting beads that separate window sash
- Remove built-up paint, particularly at jambs

To reduce air infiltration

- Replace broken glass (glazing)
- Install weather-stripping snugly between moving parts — Quality metal weather-stripping can last 20 years (Refer to *Weather Stripping & Caulk*, page 5)
- Re-caulk perimeter joints
- Remove and replace missing or cracked glazing putty
- Add sash locks to tighten windows
- Add interior or exterior storm window — A storm window can achieve similar R-values to a new thermal window
- Insulate weight pockets if no longer in use

To reduce solar heat gain or heat loss

- Install and utilize operable exterior shutters where historically appropriate
- Install interior blinds, curtains or UV window shades
- Plant deciduous trees at south and west elevations to block summer sun and allow in winter sun, and plant conifer trees at north to reduce effect of winter winds
- Install clear, transparent low-e film or glass



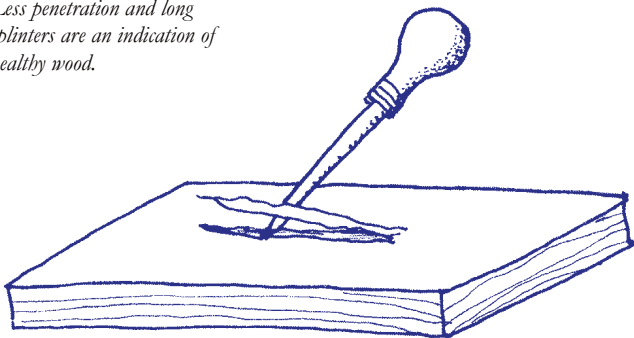
Typically, the deterioration of wood windows first occurs at the sill. Peeling paint can allow moisture to enter wood and cause rot. Regular repainting is recommended to provide a protective layer against moisture.

WINDOW REPAIR VERSUS REPLACEMENT

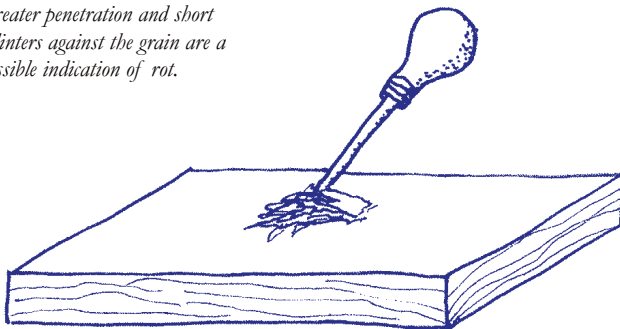
When considering repair and retention of existing windows versus installation of replacement windows, applicants are strongly encouraged to retain existing historic windows except in the case of extensive deterioration. In such a case, documentary evidence must be provided with an application. It can often be less costly to repair an existing historic wood window than to install a replacement window. (Refer to *Historic Window Problem Solving*, page 3.)

It is important to remember that although a portion of the window or door is deteriorated, replacement of the entire component or unit might not be necessary, particularly for wood windows. A simple means of testing wood window deterioration is to probe the element with an awl or ice pick. Pierce the element perpendicular to the grain at an angle where the wood appears darker in color and measure the penetration depth and damp wood and assess the type of splintering.

Less penetration and long splinters are an indication of healthy wood.



Greater penetration and short splinters against the grain are a possible indication of rot.



WOOD WINDOW REPAIR

Given the significance windows play in defining the architectural character of a building, **the BHAR strongly encourages the maintenance and repair of existing windows.** If portions of a window are deteriorated, it is often possible to replace only the deteriorated portion or component of the window. Replacement of the entire component or unit might not be necessary. When evaluating window repair versus replacement, the following guidelines can be helpful:

1. **Perform routine maintenance:** Replace broken or missing components such as trim, glazing or sash cords. Verify that caulking, glazing putty, parting beads and weather-stripping are applied securely and repaint the window.
2. **Treat or repair deteriorated components:** At the earlier stages of wood deterioration, it is possible to complete in-place treatments that do not necessitate component replacement. These include treating wood for insects or fungus, consolidating with epoxy and applying putty at holes and cracks and painting.
3. **Replace Deteriorated Components:** Replace either the deteriorated portion of wood with a "Dutchman" or the entire component if the majority is deteriorated. (A Dutchman is a repair with a piece of the same material in a sharp-edged recessed cut. Refer to photograph below.) The replacement piece should match the original in design, shape, profile, size, material and texture. New wood sills are usually easily installed, while complete sash replacement might solve problems of broken muntins and deteriorated rails.
4. **Replace Window:** If the majority of the window components are deteriorated, damaged or missing and in need of replacement, installation of a new window that matches the original window might be warranted with appropriate documentation.

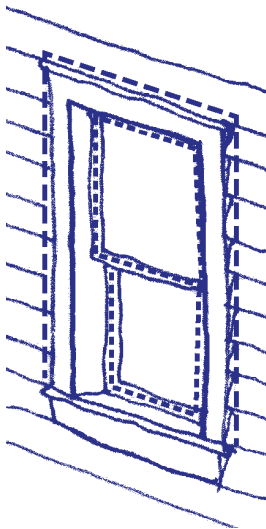


One of the advantages of historic wood windows over a modern prefabricated unit is repairability. This photograph demonstrates a Dutchman repair at the corner of the historic wood window sash. Also note the application of new glazing putty as part of the repair.

WEATHER STRIPPING & CAULK

Proper application of weather stripping and caulk around windows and doors can greatly reduce air infiltration and drafts. When selecting weather stripping or caulk, choose materials appropriate for each location and follow the manufacturer's installation recommendations for best results. Because weather stripping is used between the moving parts of windows and doors, it can easily become damaged, loose, bent or torn. Inspect weather stripping regularly, preferably every fall, and replace it as needed. For heavy-use installations such as entrance doors, it may be beneficial to install more durable weather stripping, such as spring metal or nailed felt.

The installation of caulk or other sealants should occur throughout the exterior of the building to minimize interior drafts and to protect the building's wall system from wind-driven rain. Locations where caulk is recommended include where two dissimilar materials meet; where expansion and contraction occur; or where materials are joined together. Select caulks and sealants that can be sanded and/or painted to minimize their visual appearance. In addition, care should be taken to prevent caulk or sealant from being smeared onto the face of adjacent materials since the residue might affect paint adherence. It is also important to select the appropriate type for each location and exercise care when removing old caulk that might contain lead.



Recommended weather-stripping locations:

- Behind window sash track
- Between window meeting rails
- At perimeter of doors/windows

Recommended caulk locations:

- Between door/window frame and adjacent wall
- Between abutting materials such as corner boards and siding, porch and wall surface
- Between dissimilar materials such as masonry and wood, flashing and wall surface

DEFINITIONS

Weather Stripping: A narrow compressible band used between the edge of a window or door and the jambs, sill, head and meeting rail to seal against air and water infiltration; made of various materials including spring metal, felt, plastic foam and wood with rubber edging.

Caulk: Flexible sealant material used to close joints between materials; made of various materials including tar, oakum, lead, putty and modern elastomerics such as silicone and polyurethane.

Expansion / Contraction: Building materials expand and contract due to changes in temperature, which can lead to open joints and water infiltration.



A replacement window often lacks the depth, character and detailing of a historic window. Routine maintenance ensures longevity and preservation of historic, wood windows.

WINDOW REPAIR REVIEW

The BHAR encourages:

- Retaining and maintaining serviceable historic windows
- Conducting regular inspections to determine whether maintenance is needed
- Making in-kind repairs to historic wood windows
- Replacing only components or windows that are deteriorated beyond repair
- Removing built-up paint and repainting to prevent rot and other issues
- Installing weather stripping, caulk, glazing putty and sash locks to reduce air infiltration
- Using interior storm windows rather than replacement windows as the best means to achieve energy efficiency
- Installing clear glass at all openings unless replacing cracked historic colored, beveled or frosted glass in-kind
- Replacing an inappropriate window with a historically appropriate, wood window

The BHAR discourages:

- Replacing historic wood windows with new windows made from a different material
- Removing or enclosing historic wood trim

WINDOW MATERIALS: PAST & PRESENT

Wood windows were historically manufactured from durable, close-, straight-grained hardwood of a quality uncommon in today's market. The quality of the historic materials and relative ease of repairs allows many well-maintained old windows to survive from the early 20th century or earlier.

Replacement windows and their components tend to have significantly shorter life spans than historic wood windows. Selecting replacement windows is further complicated by manufacturers who tend to offer various grades of windows, with different types and qualities of materials and warranties. Today, lower cost wood windows are typically made from new growth timber, which is much softer and more susceptible to deterioration than the hardwoods of the past. New wood windows can include aluminum or vinyl cladding, providing exterior protection and reducing maintenance. Vinyl and PVC materials, now common for replacement windows, break down in ultraviolet light, and generally have a life expectancy of less than 20 years. Fiberglass and composite windows, typically made from a combination of wood material and plastic resins, have only been available since the 1990's, so their longevity has not been fully evaluated. Because of the great variety of finishes for aluminum windows, they continue to be tested to determine projected life spans.

Other areas of concern with replacement windows, beyond the construction materials used in the frame and sash, include the type and quality of the glazing, seals, fabrication and installation. Double glazing or insulated glass, used in most new window systems, is made up of an inner and outer pane of glass sandwiching a sealed air space. The air space is typically filled with argon gas and sealed around the perimeter. This perimeter seal can fail in as few as 10 years, resulting in condensation between the glass layers, necessitating replacement to allow for clear visibility. Many of the gaskets and seals that hold the glass in place also have a limited life span and deteriorate in ultraviolet light.

Significant problems with replacement windows also result from poor manufacturing or installation. Twisted or crooked frames can make windows difficult to operate. Open joints allow air and water infiltration into the wall cavity or building interior. When selecting replacement windows, it is important to consider life span and life-cycle costs.



Historic 9/1 wood windows at left with replacement windows at right. Note that the historic, wood frame is narrower, providing a larger glazed opening.

ALUMINUM WINDOWS

When the majority of windows in commercial and large-scale residential buildings are deteriorated, property owners often seek a quality replacement window that will not require a high level of maintenance. One option that is often considered is aluminum replacement windows. Because aluminum replacement windows are typically custom made to fit within existing masonry openings, they are frequently used in larger commercial applications rather than as replacement windows for single or two-family homes.

Some of the advantages of aluminum replacement windows is that they can usually be made to replicate historic wood windows while including insulated glass for better thermal performance. This replication can include the sash operation and exterior profiled muntins matching the historic configuration. In addition, because they have a factory-applied, baked on paint finish, which can be selected to match historic paint colors, they do not require the regular repainting associated with wood windows.

Because of the strength of aluminum and its ability to fasten the parts of the window together with strong connections, aluminum replacement windows can easily outlast the lifespan of vinyl alternatives by two to three times depending on the quality of each product. Although the initial costs associated with aluminum replacement windows is typically greater than vinyl, the life-cycle costs associated with more frequent replacement of lower-quality windows might provide overall costs savings in the long run. In addition, the overall thermal performance of an aluminum replacement window tends to be higher than most vinyl windows, allowing for energy costs savings for the building occupants.

REPLACEMENT WINDOW QUALITY

Reputable mill shops, lumber yards and window specialists typically provide a better selection and higher quality replacement window options than companies that advertise with bulk mailings or flyers. Local companies are often familiar with the unique attributes of window detailing for building types and periods in Cheltenham and are a better option for matching historic detailing. Additionally, the best quality replacement window can often be found in an architectural salvage store. Because of the traditional craftsmanship and high quality of wood used in historic windows, a salvaged and repaired window will often outlast a replacement window.

REPLACEMENT WINDOW COSTS

The costs that should be anticipated when considering the installation of replacement windows include:

- Labor to remove old windows and a disposal fee
- Purchase price and delivery of new windows
- Labor and materials to modify existing framing for new windows
- Labor to install new windows
- Life-cycle cost of more frequent replacement of deteriorated components, sash and window units

FIBERGLASS & COMPOSITE WINDOWS

Fiberglass windows are made from sand, while composite windows are made from sand combined with wood pulp. When compared to vinyl windows, fiberglass and composite windows:

- Are stronger, harder and more rigid than vinyl - Thus requiring smaller frame and sash dimensions and allowing greater glass sizes and admission of sunlight
- Have similar expansion and contraction rates as wood and glass, minimizing seasonal opening of seams and joints
- Can be fabricated with profiled exterior frames and exterior muntins to approximate the appearance of wood windows
- Can have a paintable, exterior finish

Both fiberglass and composite windows tend to be more affordable than wood windows. However, there is great variety in the types of detailing, with some manufacturers doing a better job of approximating the appearance of wood windows. Care should be taken in reviewing the appearance with regard to all dimensions, such as frames, sash and muntin thicknesses, as well as overall configuration.

CLAD WOOD WINDOWS

Aluminum and vinyl clad windows are constructed of solid wood with applied exterior cladding, proving an added exterior layer of protection, thus minimizing the effects of moisture typically experienced with natural wood, such as warping, contracting or expanding and rotting. Both options can be custom made to fit the historic opening and special window shapes. Clad windows typically have simulated divided lights, in which the muntins are applied to the exterior and interior of the window glass, and sometimes between the layers of insulated glass. The muntins are available in a variety of widths and profiles, allowing compatibility with a building's architectural style when applied at the exterior face of the glass. One of the key differences is that aluminum clad options tend to have crisper detailing, more closely approximating wood than vinyl, which usually has rounded edging.

When selecting a clad window, it is important to keep in mind that it is difficult to paint both aluminum and vinyl, so the initial color selection should be in keeping with the architectural style and long-term color palette of the building. While the color selection for vinyl cladding is typically very limited, there is a greater range available for aluminum window cladding.



Although aluminum-clad windows can include exterior muntins, the profiles may not have the same refinement as historic windows, as seen here.



Vinyl windows with applied muntins lack the profiles and details of traditional wood windows and are not appropriate at historic buildings. They are also mounted flush to the outside wall without trim or casings.

VINYL WINDOWS

One of the claims of vinyl window vendors is that their replacement windows do not require maintenance. However, considering the relatively short life span of many of the materials and components, they will need continual replacement. Disadvantages include:

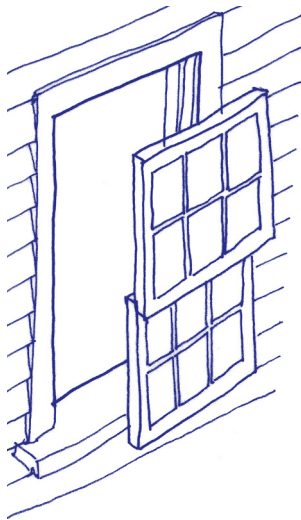
- As joints or seals in a replacement window deteriorate, openings can be formed that allow air and water to enter causing additional damage. Repair of these openings requires replacement of the deteriorated parts. This can present a problem if the manufacturer has modified the design or is no longer in business, necessitating custom fabrication of a deteriorated element or replacement of the entire window.
- The perimeter seal of double-glazing deteriorates over time. In addition, if the glazing unit is cracked or broken, it will require full replacement. This is complicated further when the double-glazing includes an applied or internal muntin grid which must be duplicated as part of the replacement.

Additionally, vinyl windows do not provide moulded trim and muntin profiles appropriate to the style and age of the building.

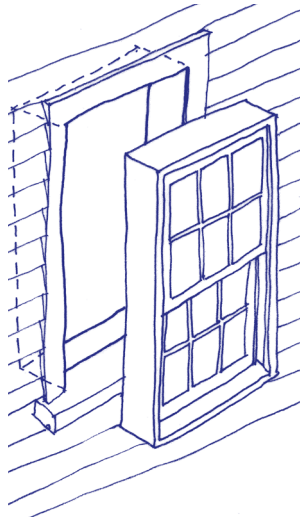
WINDOW MATERIAL REVIEW

Although replacement-in-kind is the preferred approach, the BHAR will consider the following replacement window materials, provided all options include profiled, exterior muntins, appropriate to the building style and period of construction:

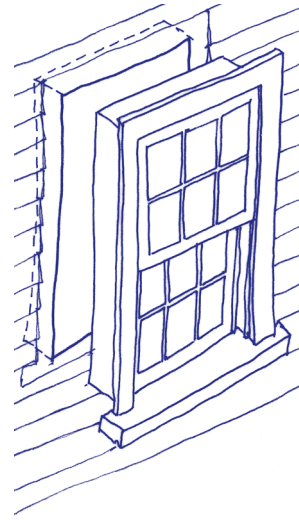
1. **Wood** windows can either be true or simulated divided lights with insulated glass and exterior muntins
2. **Aluminum** (generally limited to commercial buildings and new construction) details and profiles should generally match wood construction
3. **Fiberglass & composite** with a painted exterior finish
4. **Aluminum clad** details typically vary, and it is difficult to modify color/paint
5. **Vinyl clad** generally lacks sharp details of wood, has a glossy finish, and is difficult to modify color
6. **Vinyl** windows lack exterior profiles, details of wood, and glossy finish; are difficult to modify color; tend to require more frequent replacement — not encouraged



Sash-Only Replacement
Installation of new sash in existing frame. Can include new jamb liners.



Window Replacement Insert
Installation of new sash and frame unit within existing opening. This typically reduces the overall size of the sash and glass, reducing interior daylight.



Full Window Replacement
Installation of new sash, frame and casing. The casing should be compatible with the building style. This approach may require modification of opening or siding.

WINDOW OPTIONS

Repair or replacement of existing components:

Deteriorated sills, sash and muntins are repairable by craftsmen with wood consolidant or replacement parts, retaining original fabric and function. In-kind replacement sash components and sills can be custom-made to replace deteriorated elements if necessary. Property owners are strongly encouraged to explore repair and selective replacement parts options prior to considering whole sash or frame replacement, particularly at historically significant buildings.

Repair and selective component replacement benefits:

- Original building fabric and historic character remain
- Historic profiles, dimensions and proportions can be retained and matched
- Repairs can be completed by skilled local carpenters
- Timber used in historic windows can last substantially longer than replacement units

Sash replacement package: If the sash is beyond repair, some manufacturers offer replacement jamb liners and new sash for installation within existing window casings. (Jamb liners are the vertical internal facing between the window sash and structural frame.) Because of the loss of the historic sash, this option is discouraged by the BHAR.

Sash replacement package disadvantages:

- Stock replacement sash are often inappropriate to the size, profiles and proportions of existing openings and detailing
- Replacement sash have a limited warranty, likely needing another partial or full replacement in 10 to 25 years as seals and joints open
- Modification of the jambs is necessary
- Liner often made from vinyl or other inappropriate material
- The jamb liners do not always work well in existing window openings and might need more frequent replacement
- Out-of-square (wracked) openings can be hard to fit, making window sash hard to operate, and seals might not be tight
- Historic sash are removed and become landfill debris

Frame and sash replacement unit: If the frame is beyond repair, a frame and sash replacement unit is a complete frame with a pre-installed sash of various muntin patterns for installation within an existing window frame opening. Due to the total loss of the sash and modification of the frame, this is discouraged by the BHAR for historic buildings. It might be an option in new construction, based upon the specific circumstances of a project.

Frame and sash replacement unit disadvantages:

- Stock replacement sash are often inappropriate to the size, profiles and proportions of existing openings and detailing
- As the surrounding frame typically must be modified, alteration of built-in surrounds might be required and two frames and sills are typically visible at the exterior
- The size of the window sash and glass openings are reduced due to the new frame within the old frame
- In-fill might be required for non-standard sizes
- Modification of existing casing and sills may be required
- Historic sash are removed and become landfill debris



Stock replacement units may not match detailing of historic windows. Changes to the stile and rail dimensions and sill, head, casing and muntin profiles alter the appearance of a window.

MODIFYING OR ADDING OPENINGS

The arrangement, size and proportions of window and door openings are key components of a building's style and character. As a result, the modification or addition of window or door openings, particularly on more prominent building façades, is strongly discouraged. This includes the infill of all or part of an opening to make it smaller or to visually remove it. It also includes increasing the size of a door opening to provide a larger opening for a display window, garage, loading dock or other use.

INSTALLING REPLACEMENT WINDOWS

When installing windows, it is important to keep in mind that the overall appropriateness of any installation is largely based upon its details. It is generally best to review buildings of similar style, materials and construction period for the appropriate details for a project.

- **Wall Plane** — An easy way to identify new windows is by how far back a window is set into a wall plane from the outside wall face. A historic window tends to have greater depth than a new window, with the window casing, frame and sash receding back from the wall plane, providing shadow lines between components.
- **Casing & Sill** — Many replacement windows do not come with a factory-installed casing or sill, requiring them to be field-applied by a contractor during installation. To ensure that the replacement windows look like they “fit” a building, the stylistically appropriate casing and sill should be installed related to the building's style and construction type, either masonry or wood-framed.



Replacement windows should match the historic opening size and shape. For example, round-headed openings should not be modified to accept square-headed sashes.



The historic wood casing and sill should be repaired and repainted. Enclosing wood elements can hide deterioration and lead to additional problems.

WINDOW REPLACEMENT REVIEW

If replacement windows are warranted, the BHAR encourages:

- Relocating historic windows to the publicly visible elevations and installing replacement windows at less visible areas
- Installing quality wood windows when replacement is deemed necessary
- Choosing window style or configuration based upon historical or physical documentation
- Matching the original dimensions [including for the stile and rail], shape, operation, muntin pattern, profiles [including the sill and head] and detailing to the greatest extent possible
- Selecting true divided-light windows when at all possible
- Maintaining serviceable trim, hardware and components or utilizing hardware appropriate for the historic period
- Review of various grades of windows offered by manufacturers
- Utilizing quality materials throughout the installation process
- Understanding the limits of the warranties for all components and associated labor

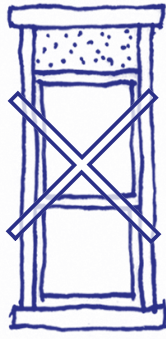
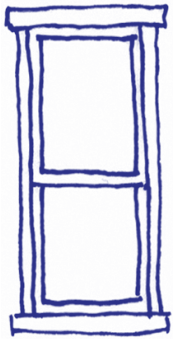
- Selecting a reputable manufacturer and installer who is likely to be in business and respond if there is a future problem
- Using storm windows rather than replacement windows as the best means to achieve energy efficiency
- Reducing solar heat gain or loss through such activities as: utilizing shutters, blinds or curtains, strategically locating trees and installing UV protection

The BHAR discourages:

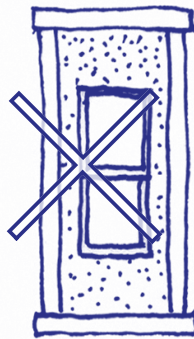
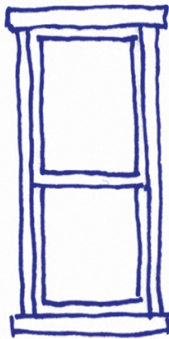
- Replacing historic wood windows with new windows made from a different material
- Decreasing or enlarging window size or altering the shape to allow for installation of stock window size
- Increasing window sizes or altering the shape to allow for picture or bay windows
- New window openings at publicly visible elevations
- Filling or closing in window openings
- Interior or internal muntin grids for multi-paned appearance
- Single-light windows where multi-paned windows historically existed

INAPPROPRIATE REPLACEMENT WINDOWS

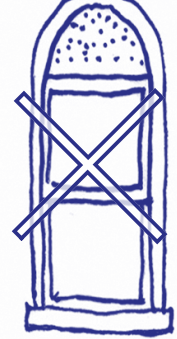
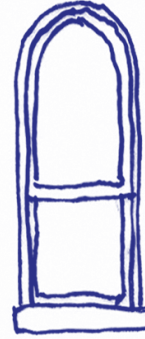
The following diagrams indicate historic windows with **inappropriate** examples of replacement windows. When considering a replacement window, the size, operation, configuration, shape and proportions of the existing window must be replicated and historic trim must be retained or replicated.



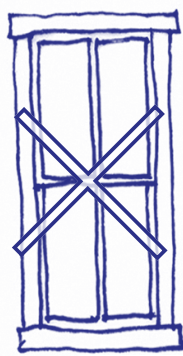
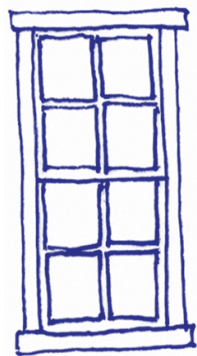
Size: The replacement window should be sized to fit the window opening – An infill panel should not be installed



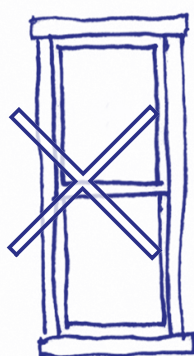
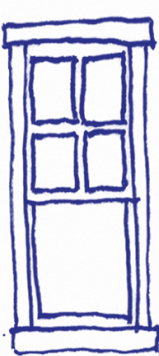
Size: The replacement window should be sized to fit the window opening – An infill panel should not be installed



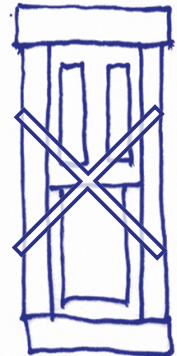
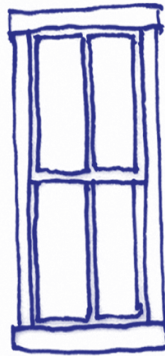
Shape: The replacement window should be shaped and sized to fit the window opening – An infill panel should not be installed



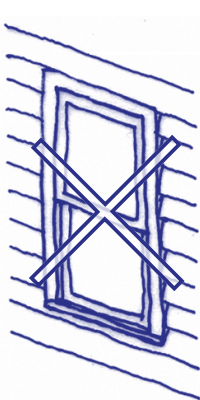
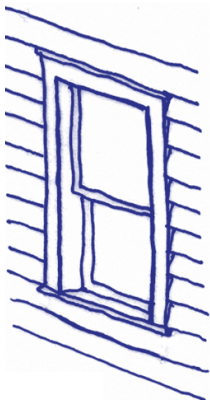
Configuration: The replacement window should have a 4/4 light configuration to match the historic window



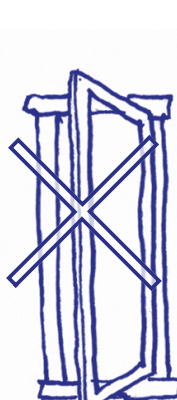
Configuration: The replacement window should have a 4/1 light configuration to match the historic window



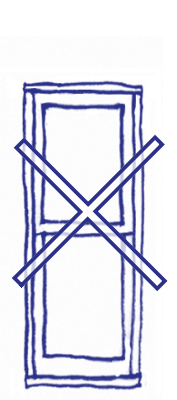
Proportions: The proportions of window components should match the historic window including the size of the frame and muntins



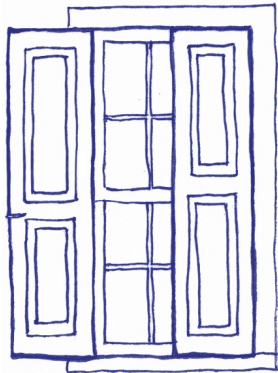
Depth in Wall: The location of replacement window should be set back into the wall the same distance as the historic window



Type: The replacement window should match the type of historic window

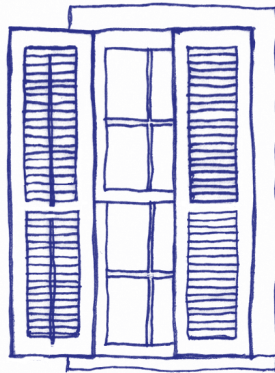


Decorative trim: Decorative trim should be retained or replaced to match the historic trim



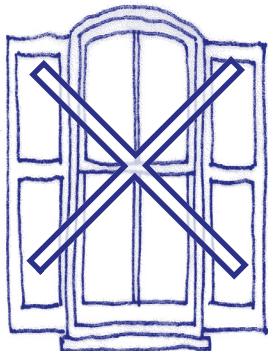
Paneled Shutter

Six-over-six double-hung window with paneled shutters



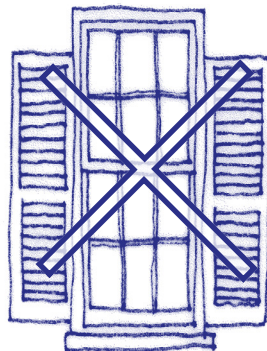
Louvered Shutter

Six-over-six double-hung window with louvered shutters



Not Recommended

The shutters do not fit the arched opening of the window



Not Recommended

The shutters are too short and narrow for the window

SHUTTERS

Historically, exterior shutters were used as shielding devices to modulate light and protect against inclement weather. Paneled shutters were installed to provide a solid barrier when closed and louvered shutters were used to regulate light and air. Shutters were not used on all historic buildings or in all locations. Some building styles did not typically include shutters. It is often possible to determine if shutters previously existed by looking for hardware such as hinges or tie-backs or evidence of their attachment, such as former screw holes in the window casing.



These shutters are not wide enough to fully cover the window when closed and lack hardware, including hinges. Shutters should be wood, operable and sized to fit window openings when closed.



Repairing and repainting the deteriorated shutters will extend their lifespan, postponing costly replacement.



Shutter hardware should be compatible with the building style and typically includes hinges, pintles, hold-backs ("shutter dogs") and hold-opens

SHUTTERS REVIEW

The BHAR encourages:

- Maintaining historic shutters
- Installing shutters where they existed historically
- Operable shutters made of materials with a paintable finish that match the original size, shape and type with refurbished or appropriate hardware
- Shutters of the appropriate style for the house and location
- Appropriately sized and shaped shutters for the window opening, fitted to cover the entire window when closed
- Retaining and reusing or utilizing refurbished historic shutter hardware

The BHAR discourages:

- Installing shutters where they did not exist historically
- Shutters screwed or attached to the face of the building or window trim
- Installing vinyl or aluminum shutters

SCREEN / STORM WINDOWS

Screens and storms should conceal as little of the historic window or door as possible and should be selected to complement each window or door type. This generally means selecting a half-screen for double-hung windows and a wood storm window that has rails that coincide with the frames, rails, stiles and glazing pattern and overall configuration of the associated window.

The most recommended option for a screen or storm sash is a simple wood framed opening with minimal ornament. If more elaborate detailing is desired, the style and level of detailing should complement the building style; for example, a screen or storm window with Victorian gingerbread would not be appropriate for a Colonial style house.

STORM WINDOWS REVIEW

The BHAR encourages:

- Interior storms to minimize the change to the exterior appearance
- Retaining wood storm frames rather than replacement with aluminum or vinyl; wood storm windows can be custom made to fit any size or shaped opening, and lose less heat through the frame than aluminum
- Simple storm windows that reveal as much of the historic window as possible and match the size and shape of the original opening
- Aligning the divisions of the storm window with the divisions of the window, revealing as much of the historic window as possible
- Utilizing glass rather than Plexiglas, which can discolor and alligator
- Painting the storm window frame to match the adjacent window trim
- Minimizing damage to historic windows and frames during the installation of storm windows
- Caulking and weather-stripping the storm window in accordance with manufacturer's instructions allowing for exterior drainage at the sill
- Removable storm sash to facilitate maintenance of historic window

The BHAR discourages:

- Vinyl, aluminum, metal or other synthetic materials for storm frames – Wood frames can be custom made to fit any size or shape opening
- Stock storm units that require in-fill panels within an existing window opening
- Storms adhered or fastened directly to window or door trim, shutters or blinds
- Triple track exterior aluminum storm sash at visible street elevations
- Fixed storm sash



The treatment of the storm sash impacts the way the windows are seen from the exterior. To minimize impact of storm window installation, the storm sash should align with the window elements.



Half-screens installed at only the lower sash limits concealment of the historic windows provided the screen rails align with those of the historic windows.

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Preservation Design Partnership, LLC
Philadelphia, PA www.pdparchitects.com