WINDOWS + SHUTTERS

Docket Item #17

Required Approvals

There are different levels of review for buildings constructed before 1932 (Early Buildings) and after 1931 (Later Buildings). These levels are applicable in most cases. Please note that during the administrative review process, Staff may determine that a project requires Board review. Contact Staff at 703.746.3833 to confirm which level of review is required for your project. Also, contact Code Administration at 703.746.4200 to confirm building permit requirements.

Early Buildings (pre-1932)

NO REVIEW	ADMINISTRATIVE (STAFF) REVIEW	BOARD REVIEW
Routine maintenance or minor repair of windows (Type 1 and 2)	Major repair (Type 3) or replication in-kind (Type 4) of historic windows	Replacement of windows that are historically or architecturally significant
Replacement of windows that are entirely below grade or not visible from the public right-of-way	Replacement of non-historic windows	Changing window size, material, location, or operation
Removal of shutters or security bars	Changing window light configuration	Removing and infilling windows visible from the public right-of-way
	Replacement of security bars	Installation of security bars
	Installation or replacement of shutters	

Later Buildings (post-1931)

NO REVIEW	ADMINISTRATIVE (STAFF) REVIEW	BOARD REVIEW
Routine maintenance or repair of windows (Type 1, 2, and 3)	Replication in-kind (Type 4) or replacement of windows	Replacement of windows that are historically or architecturally significant
Replacement of windows that are entirely below grade or not visible from the public right-of-way	Changing window material or light configuration	Changing window size, location, or operation
Removal of shutters or security bars	Replacement of security bars	Removing and infilling windows visible from the public right-of-way
	Installation or replacement of shutters	Installation of security bars

WINDOWS + SHUTTERS

Introduction

Windows are a principal character-defining feature of a building, serving both functional and aesthetic purposes. Their size, location, type, material, and trim are essential to a building's architectural style. Changes to these elements can significantly affect the historic appearance of a structure.

In general, Federal and Georgian buildings in Alexandria featured windows with multiple small panes of glass and thin muntins. From 1840 to the early 1900s, cylinder glass was commonly used. This type of glass was produced by blowing molten glass into a cylinder, cutting it open, and reheating it to form flat sheets. Cylinder glass typically contains small imperfections, such as bubbles or "reams" (wave-like distortions or fold marks).

By the mid-19th century, advancements in glassmaking allowed for the production of larger panes with wider muntins. This innovation enabled Victorian-era windows to feature large expanses of glass, often with minimal or no muntins. Windows from the Victorian period (mid-19th to early 20th century) typically have two-over-two or one-over-one sash configurations. Bay windows also began appearing in the mid-19th century and are common on both Victorian and Colonial Revival buildings. Colonial Revival structures generally feature multi-light windows with small panes in the upper sash and a single pane below.

The mid- to late 20th century saw increased use of commercially available non-wood window materials:

- Wood composite windows (introduced in the 1960s) are made from polymers and wood fibers.
- Aluminum-clad windows (introduced in the 1970s) feature a wood interior and an aluminum exterior.
- Fiberglass windows (introduced in the 1980s) are made from a composite of polymers and extruded glass fibers.

Like windows, shutters are an important visual element in the overall composition of a building and serve both functional and decorative purposes. Historically, they helped regulate interior temperature and ventilation and offered protection during severe weather. Shutters also visually define the openings on a building façade.Inappropriate or non-functional shutters detract from a building's design integrity and can create a misleading impression of its architectural character.

Glossary

Muntin: A strip of metal or wood separating panes of glass within a window sash.

Mullion: A vertical shaft between two window panes that provides structural support.

Sash Kit Replacement: Replacement of the window sash panel(s) without removing the existing frame.

Insert (Pocket-Style) Replacement: Installation of a new window sash and frame into the existing frame, usually resulting in less glass area and wider trim.

Single Glazing: A single pane of thick glass.

Double Glazing: Two panes of glass separated by a layer of gas.

True Divided Light (TDL): Multiple panes of glass separated by muntin bars.

Simulated Divided Light (SDL): Permanently fixed muntins on both the interior and exterior of the glass, with spacer bars between the glass.

Grilles Between Glass (GBG): Single grille sandwiched between two panes of glass; also known as "sandwich muntins".

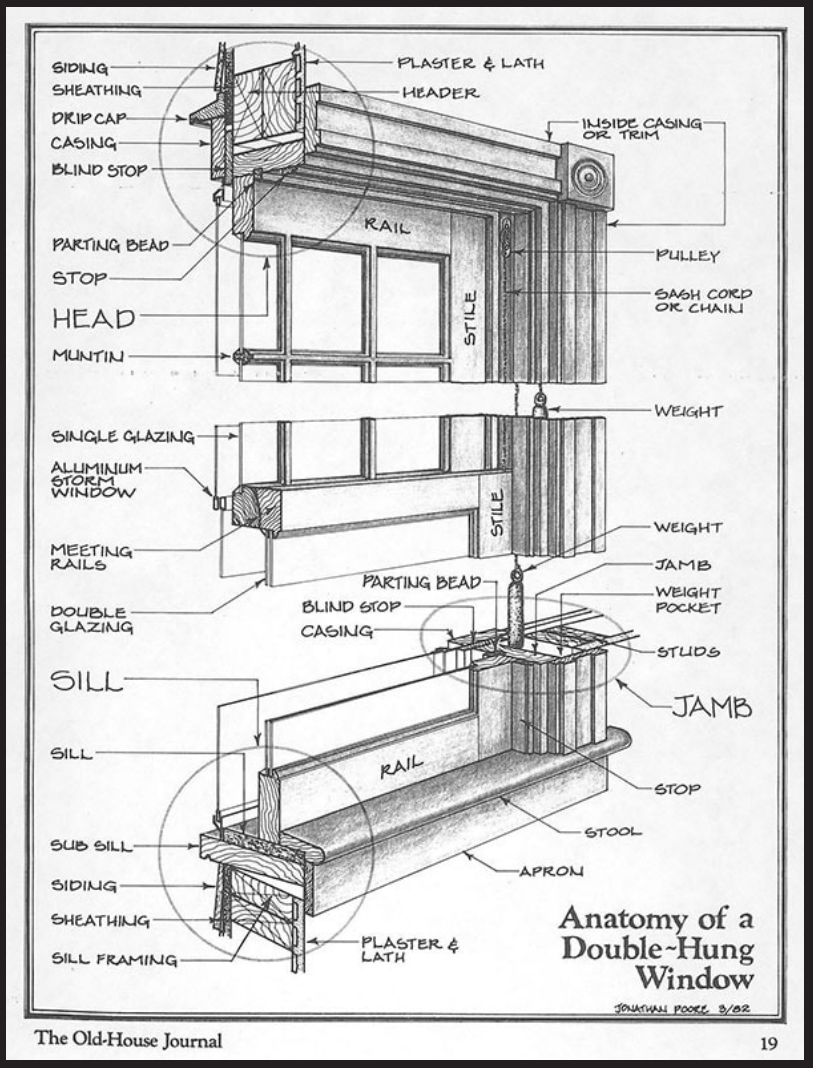
Visible Light Transmission (VLT): The amount of light that passes through window glass.

Low Emissivity (Low-E) Glass: Has a coating that minimizes the amount of ultraviolet light that can pass through the window glass without compromising the amount of visible light transmitted.

Shading Coefficient: The ratio of solar heat gain passing through window glass in comparison to a standard piece of 1/8-inch thick clear glass.

Storm Window: Window mounted outside or inside of the main glass windows, providing more insulation and reducing air movement into and out of the windows.

WINDOWS + SHUTTERS



This diagram shows the parts of a typical historic window as viewed from the inside.

Window Maintenance, Repair, and Replacement

Historic windows require regular maintenance in order to maintain their functionality and structural integrity. The Board encourages the retention and repair of historic windows whenever possible. This section gives an overview of four types of window conditions and what types of repairs they entail. These range from Type 1, which includes various types of routine maintenance, to Type 4, in which the condition of the window is deteriorated to the point that a replication in-kind may be appropriate.

Type 1: Routine Maintenance

- Replacement of glazing putty
- Minimal replacement of broken window panes
- Repainting and/or removal of loose paint
- Repair or replacement of window sash weights/chords
- Installation of weatherstripping
- Installation or replacement of storm window

Type 2: Minor Repairs

- May require removal of sashes to perform repairs
- Repair or fill of sections of window sash or frame material
- Repair of sections of muntins
- Repair of exterior window trim
- Replacement or installation of up to 50% of window panes

Type 3: Major Repairs and Partial Replacement

- May require removal of sill and frame to perform repairs
- Replacement of sections of window sash or frame material in-kind
- Replacement or installation of more than 50% of window panes
- Reframing or reconstruction of existing window opening

Type 4: Beyond Repair

- May require a replication of the window in-kind (material, profile, and size of rail, stile, and glazing type)

Staff will evaluate windows in the field using these conditions to determine what type of repair work is most appropriate. Major repairs, replication, or replacement of windows that are visible from the public right-of-way generally require review, while routine maintenance and minor repairs do not require review. Where Staff makes a written finding that a window is not visible from the public right-of-way, the window is not regulated by the BAR and may be replaced with any suitable window allowed by the Virginia Unified Statewide Building Code (USBC).

Window Guidelines

There are different guidelines for buildings constructed before 1932 (Early Buildings) and after 1931 (Later Buildings). Windows on new construction follow Later Building guidelines. When an administrative review is requested, window manufacturer technical specification sheets, or "cut sheets", must be submitted to BAR Staff to confirm compliance with these guidelines. If Staff is unable to verify that a window complies with the guidelines, the Board will review the request.

All Buildings

- Window frames, sashes, and glass should be repaired rather than replaced, when possible.
- Character-defining features of windows should not be altered.
- Replacement window materials, operation, and configuration should be appropriate to the architectural style and/or period of significance of the building.
- Replacement windows should fit the original window opening; full frame replacement or unframed sash replacement kits are acceptable. Insert windows are not appropriate.
- Low-E glass is encouraged for energy conservation, but the glass must have a minimum 72% VLT and a reflectance of less than 10%. Low-E 272 glass meets these requirements.
- Windows should not be painted, inappropriately tinted, or otherwise made opaque.
- The exterior of sash muntins must have a putty-glazed profile; the interior of sash muntins may have any profile.
- Multi-light single-gazed windows should be True Divided Light, while multi-light double-glazed windows should be Simulated Divided Light; Grilles Between the Glass are not appropriate.
- Spacer bars should be dark in color.
- Vinyl windows are not appropriate.
- The Board discourages cladding or capsulating existing wood jambs, sills, or trim.
- The vinyl weatherstrip portion of wood window jambs should be minimally visible.
- Security bars should be minimally visible and architecturally appropriate.

WINDOWS + SHUTTERS

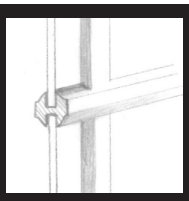
Early Buildings (pre-1932)

- Historic windows on Early Buildings should be repaired rather than replaced (Type 1, 2, and 3). Replication in-kind (Type 4) is encouraged where the windows are historically or architecturally significant.
- If Staff or the Board determines that a window can be replaced, every effort should be made to maintain the design consistency of the facade. For example, if one window needs to be replaced, it should replicate the remaining windows.
- When restoring the appearance of historic cylinder glass in original window sash, only restoration glass with the minimum amount of visual distortion should be used. Restoration glass should not be used on new windows.
- The exterior architectural style, dimensions, and proportions of window rails, stiles, muntins, frame, sill, and exterior trim must match historically appropriate window appearance. Exterior trim may not be mitered at the corners.
- On street-facing sides, windows should be made of wood. Multi-light windows should be single-glazed; double glazing may be used for windows that are in a one-over-one or two-over-two configuration.
- On non-street facing sides, windows may be made of wood or aluminum-clad wood. Double glazing may be used for any configuration.

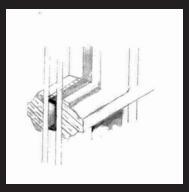
Later Buildings (post-1931)

- Windows on Later Buildings can generally be replaced, but historically or architecturally significant windows should be repaired or replicated in-kind.
- Windows may use modern materials such as wood composite, aluminum-clad wood, and fiberglass, but not hollow vinyl or vinyl cladding.
- Double glazing may be used on any elevation.
- Single horizonal metal muntin and metal casement windows may be appropriate for buildings dating from the late 1940s or early 1950s.
- Fiberglass windows may generally replace steel sash windows on any building when using the same light configuration, color, and operation, except where Staff believes an architecturally-significant building has existing intact and restorable steel sash.

WINDOWS + SHUTTERS

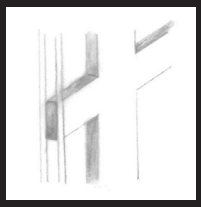


True Divided Light (TDL) muntins



Simulated Divided Light (SDL) muntins

The window shown above fits the opening size, has permanently adhered interior and exterior muntins, clear and non-reflective glass, and is an appropriate style for this mid-19th-century rowhouse.



Interior between-the-glass or sandwich muntins

Sandwich muntins, such as the example shown above, are not appropriate in the historic districts.

^ BEFORE

^ AFTER

The windows on the right are an example of an inappropriate replacement of original metal casement windows, such as those shown on the left. The replacement windows are inappropriate because they are vinyl with sandwich muntins and are a different operation and style than the original. Property owners should be aware that suitable replacement options exist for metal casement windows using modern materials that match the historic muntin configuration and style.

WINDOWS + SHUTTERS

Shutter Guidelines

- Historic shutter hardware should be retained rather than removed or replaced.
- Shutters should be operable and appropriately sized to fit the window opening when closed.
- Shutters may be made of wood or a solid, paintable composite material, but not hollow vinyl or aluminum.

The shutters on the left are correctly sized to the opening and operable, with appropriate hardware. The shutters on the right are too tall for the opening, the wrong shape, and are screwed to the wall.

Additional Information

- For guidelines on dormer windows, refer to chapter on dormers.
- The capsulation or removal of over 25 square feet of window or wall area requires a Permit to Demolish.
- Bay windows are permitted to project 20 inches or less into a required yard; refer to § 7-202 of the Zoning Ordinance.
- Windows that project into the public right-of-way may require an encroachment permit from Transportation & Environmental Services.
- Windows that are used to satisfy emergency egress requirements must meet the requirements of the Virginia Uniform Statewide Building Code (USBC).
- Sash replacement kits help preserve historic frames and trim.
- Regular painting and weather stripping of windows helps ensure longevity and promote environmental sustainability.

Storm Windows

Storm windows provide a cost-effective and thermally efficient means of energy conservation. They reduce exterior noise and reduce maintenance of historic windows. They can be installed on the exterior or interior. Because they protect historic windows, they are not regulated by the BAR and do not require review, as long as the glass is clear and non-reflective. The Board recommends that the color of the storm window frame match the color of the main window frame.

Installation of an exterior storm window.

Additional Resources

National Park Service Preservation Brief #9: The Repair of Historic Wooden Windows

National Park Service Preservation Brief #13: The Repair and Thermal Upgrading of Historic Steel Windows

Window Preservation Alliance

Window Types and Technologies (U.S. Department of Energy)

Window Glossary (Window & Door Manufacturers Association)

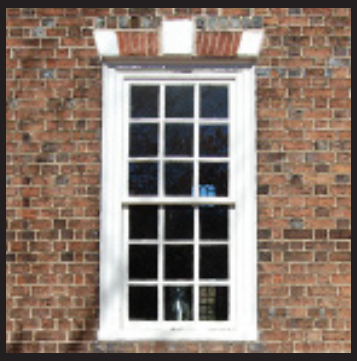
Saving Windows, Saving Money: Evaluating the Energy Performance of Window Retrofit and Replacement (National Trust for Historic Preservation Green Lab)

A Comparative Study of the Cumulative Energy Use of Historical Versus Contemporary Windows

WINDOWS + SHUTTERS

WINDOW CONFIGURATIONS FOUND THROUGHOUT THE DISTRICTS

^ 12/12 GEORGIAN



^ 9/9 GEORGIAN

^ 6/6 FEDERAL / GREEK REVIVIAL

^ 6/9 GREEK REVIVIAL

^ 4/4 LATE GREEK / EARLY VICTORIAN

^ 2/2 VICTORIAN

^ 1/1 VICTORIAN

^ GOTHIC REVIVAL

^ COLONIAL REVIVAL / CRAFTSMAN

WINDOWS + SHUTTERS

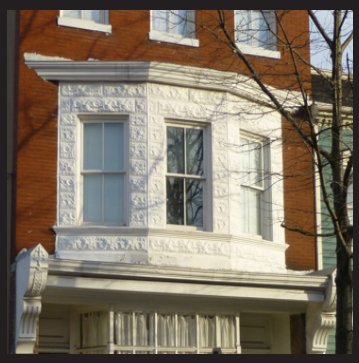
ARCHITECTURALLY SIGNIFICANT WINDOWS FOUND THROUGHOUT THE DISTRICTS

^ GOTHIC REVIVAL

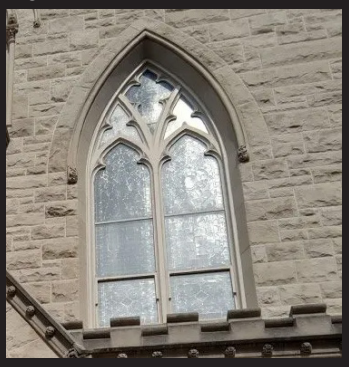
^ BOX BAY

^ ORIEL

^ PALLADIAN / VENETIAN



^ BOW



^ LANCET TRACERY

^ ROUND / ELLIPTICAL

^ LUNETTE

^ OCULUS / BULLSEYE