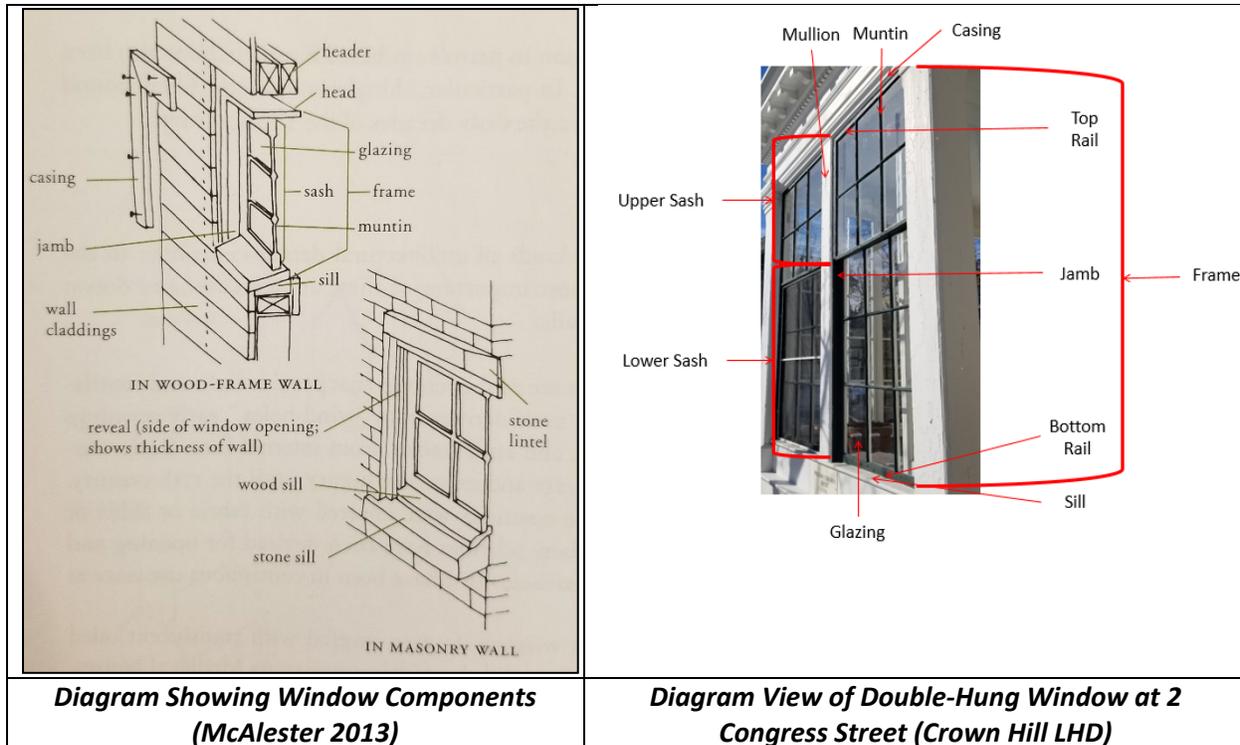


City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

Definitions



Casing: The exterior trim around a window unit, also sometimes referred to as a “surround.”

Frame: The frame is what holds together a window unit, and together with its contents (glazing and sash), is inserted into a wall opening. A typical window frame is made up of four members: two **jamb**s (vertical sides), and a top and a bottom **rail** (horizontal members that connect the jambs).

Glazing: The glass piece(s) in a window that light an interior space.

Lintel: A horizontal, sometimes decorative, support bar above a window opening. Lintels are often wood, brick, cut stone, cast stone (refined Portland cement), cast concrete, or steel.

Mullion: Vertical divider between adjacent windows.

Muntin: Individual vertical and horizontal members (typically made of wood or metal) that hold glazing in place within the window unit. Also sometimes called glazing bars.

Sash: The moveable part(s) of a window that allow it to open and close (unless it is a fixed sash window) for airflow. Sash may be referred to as “upper” or “lower” in an operable window.

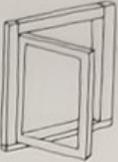
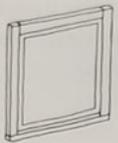
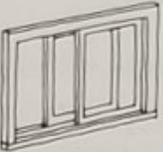
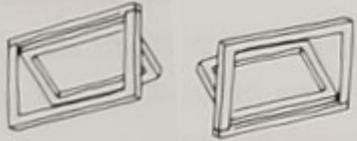
Sill: A horizontal, sometimes decorative, support bar beneath a window opening. Sills are often wood, brick, cut stone, cast stone (refined Portland cement), cast concrete, or steel.

Window: An opening in an elevation, foundation, or roof of a structure or building that is typically fitted with moveable glazed sash to allow for light and air transmission to an interior space.

City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

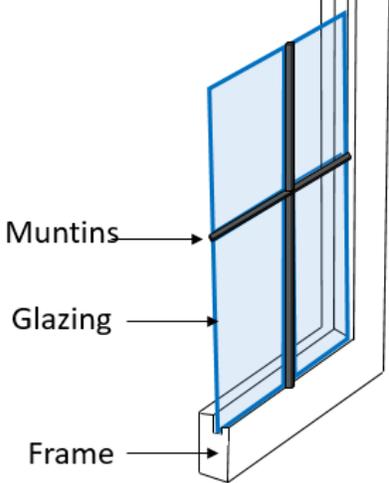
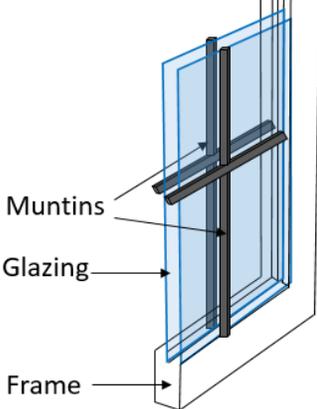
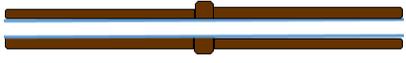
Typical Sash Types		
Window Type		Description
Casement Sash		Casement sash operate by swinging out on hinges to the left or right.
Double- and Single-Hung Sashes		Double- and single-hung sashes operate by sliding up and down. Both the top and bottom sash are moveable in double-hung windows. The top sash is fixed in place in single-hung windows.
Fixed Sash		Fixed sash exist only to light a space. They do not operate, or allow for air flow.
Sliding Sashes		Sliding sashes operate by sliding to the left or right. Sometimes one sash is fixed in place.
Hopper Sash		Hopper sash operates by hinging into an interior space, either upwards (with the hinges on the top), or downwards (with the hinges on the bottom). They are typically used in basements or near the top of a wall to allow for ventilation of a space.
Awning Sash		Awning sash operates by hinging out, to the exterior of a building, with the hinges at the top of the unit. They allow for airflow even in inclement weather.
Louver/Jalousie Window	 1	A louver (also called jalousie) window consists of louvers set in a track in a window frame. The louvers may be operated by a crank, string, or other mechanism that opens and closes them. They allow for natural light and airflow even in inclement weather.

¹ All sash images from McAlester 2013.



Windows

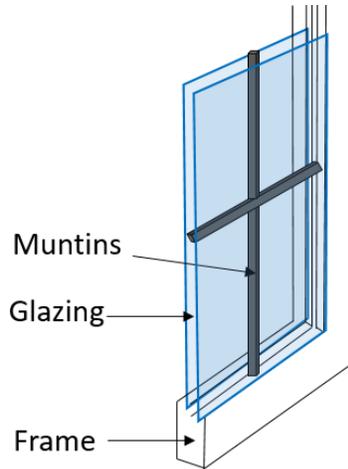
Typical Muntin Application Types

Type	Description
<p>True Divided Light (TDL)</p>   <p>Muntins →</p> <p>Glazing →</p> <p>Frame →</p>	<p>True divided light windows consist of multiple panes of single-glazed glass affixed to muntins with glazing putty. Original historic windows that have muntins are always true divided lights, unless they were originally 1/1 sash and fitted with snap-ins.</p> <p><i>Materials Used Historically:</i></p> <ul style="list-style-type: none"> • Residences: Wood • Commercial or industrial buildings: aluminum, steel, wood
<p>Simulated Divided Light (SDL), sometimes called Full Divided Light (FDL) if there is a spacer bar</p>   <p>Muntins →</p> <p>Glazing →</p> <p>Frame →</p>  <p>View from above without spacer bar</p>  <p>View from above with spacer bar</p>	<p>Simulated divided light windows came into use in the late 20th century. They consist of one pane of double glazed glass with muntins mechanically attached with a high strength adhesive to the exterior and/or interior to give the window unit a more traditional appearance. Sometimes there is also a piece called a “spacer bar” or “shadow bar” inserted between the panes of glazing to give a more authentic look.</p> <p><i>Materials Available:</i> Wood, wood polymer, wood or wood polymer clad in aluminum or vinyl, steel, aluminum, vinyl, PVC, fiberglass</p>



Windows

**Muntins Between the Glass,
sometimes called “Grids Between
Glass” or “Grilles Between Glass”
(GBG)**



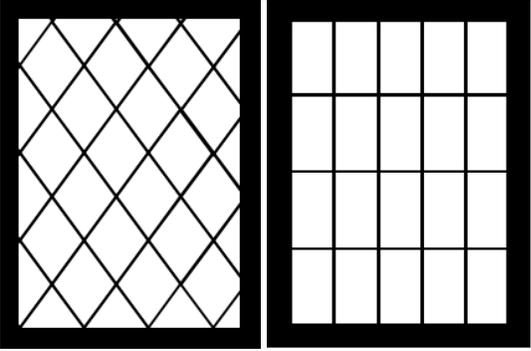
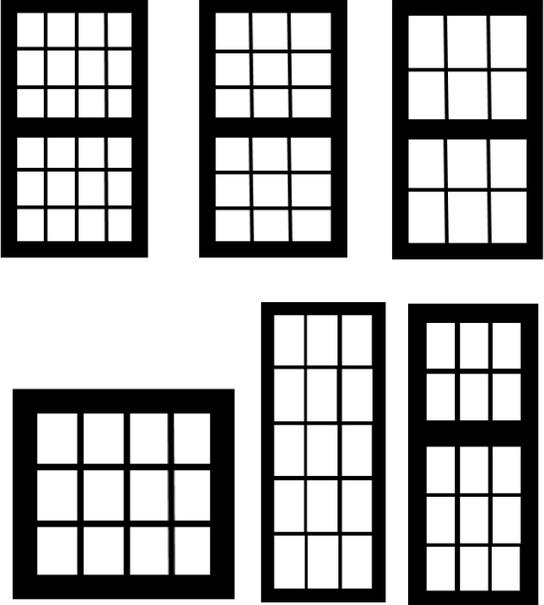
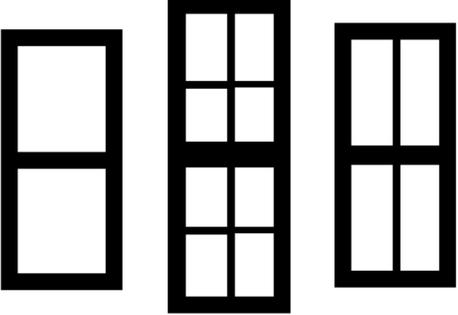
Windows with the muntins between the glass came into use in the late 20th century. They consist of a single pane of double-glazed glass with a grid system inserted between each layer of glass.

Materials Available: Wood, wood polymer, wood or wood polymer clad in aluminum or vinyl, steel, aluminum, vinyl, PVC, fiberglass

City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

Typical Residential Windows	
Time Period	Common Window Types (not exhaustive)
17 th Century	<p>Material: Wood or iron frame, leaded glass</p> <p>Typical Operation: Fixed-sash or casement windows</p> <p>Muntin Patterns: Diamond pattern, sometimes rectangular</p> 
18 th – Mid-19 th Century	<p>Material: Wood</p> <p>Typical Operation: Single-hung (early examples only), double-hung, fixed sash, casement</p> <p>Muntin Patterns: 12/12, 9/9, 6/6, 6/9, multi-pane fixed or casement</p> 
Mid-19 th Century–Mid-20 th Century	<p>Material: Wood, aluminum, steel</p> <p>Operation: Double-hung, casement</p> <p>Muntin Patterns: 4/4, 2/2, 1/1 or revival of earlier pattern</p> 



Windows

Windows are often referred to as the “eyes of a building.” Historic wood and metal windows, unlike many of their modern material counterparts, were made to be repaired. What we now call a “true divided light window,” in which individual panes of glass were puttied onto individual muntins, or glazing bars, and set in a frame, was once the norm. Because true divided light windows consist of many individual parts, they can sometimes be repaired relatively inexpensively by simply replacing failing members. Original windows should be maintained whenever possible; particularly when they are unique, of exceptional architectural quality, and/or contribute significantly to the architectural integrity of the building.

Sometimes, though, windows do need to be replaced. In many circumstances, maintaining historic windows becomes infeasible, both or either structurally and financially. In situations where replacing existing windows is justified, it is of utmost importance that an appropriate window be installed in its place. In making a determination of what might constitute an appropriate replacement window is repair is not an option, they first must consider just how significant the original or historic windows are to the character of the building as a whole. The National Park Service’s *Preservation Briefs: 9 The Repair of Historic Wooden Windows* states that “...many styles of...windows have come to be associated with specific building periods or architectural styles, and this is an important consideration in determining the significance of windows, especially on a local or regional basis. Site specific, regionally oriented architectural comparisons should be made to determine the significance of windows in question. Although such comparisons may focus on specific window types and their details, the ultimate determination of significance should be made within the context of the whole building, wherein the windows are one architectural element.”

If it is found that the window(s) proposed for replacement themselves are a highly significant feature within the context of the whole of the building (i.e. stained or leaded glass windows that are not easily replicated, or windows of which few examples exist), the Commission should take extra care to ensure that the window(s) will be repaired or replicated. They should request documentation from skilled craftsperson(s) detailing the condition of the window(s) in question, and work with the applicant to formulate a plan to either repair or replicate the window(s), or ultimately deny the request for replacement.

In cases where they window(s) proposed for replacement may contribute to the character of the building, but are not a highly significant feature within the context of the building as a whole, replacement windows may be permissible.

The Commission should use the scenarios in the table below, which are representative of common window project types, and the most appropriate responses to each, as guidance.

City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

Scenario	Does the Commission have purview?	Can this be appropriate?	Most Appropriate/First Course(s) of Action	Usually Appropriate/Secondary Course(s) of Action	Not Appropriate (typically only permissible with a Certificate of Hardship)	Certificate to be Issued
<i>An applicant would like to replace their late 20th century replacement windows, either visible from the public way or not, with windows of the same material and design.</i>	No	N/A	N/A	N/A	N/A	A Certificate of Non-Applicability should be issued, given that the Commission may not prevent repair or replacement of any exterior architectural feature within an historic district which does not involve a change in design, material, color or the outward appearance thereof.
<i>An applicant would like to replace their original windows, eliminate a window opening, or create a new window opening, in a place not visible from any public way, with any type of window.</i>	No	N/A	N/A	N/A	N/A	A Certificate of Non-Applicability should be issued, given that the Commission shall not consider architectural features not subject to public view.

City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

Scenario	Does the Commission have purview?	Can this be appropriate?	Most Appropriate/First Course(s) of Action	Usually Appropriate/Secondary Course(s) of Action	Not Appropriate (typically only permissible with a Certificate of Hardship)	Certificate to be Issued
<p><i>An applicant would like to replace their original or historic wood windows, which are visible from the public way</i></p>	<p>Yes</p>	<p>Yes</p>	<p>Repair if possible</p> <p>OR</p> <p>True divided light wood replacement windows with single glazing to match the sash operation type and muntin pattern of the original or historic window to be removed.*</p> <p>*Note: Few major window manufacturers produce true divided light windows, so they typically are custom made. Given the expense associated with true divided light windows, they are rarely used in replacement projects.</p>	<p>Simulated divided light wood windows with exterior muntin profile and spacer bar to match the sash operation type and muntin pattern of the original or historic window to be removed.</p> <p>OR</p> <p>Simulated divided light fiberglass, wood polymer, or paintable PVC windows with exterior muntin profile and spacer bar to match the sash operation type and muntin pattern of the original or historic window to be removed.</p> <p>OR</p> <p>Simulated divided light wood or wood polymer construction windows clad in baked enamel or custom painted aluminum with exterior muntin profile and spacer bar to match the sash operation type and muntin pattern of the original or historic windows to be removed.</p> <p>OR</p> <p>Simulated divided light aluminum construction windows with exterior muntin profile and spacer bar to match the sash operation type and muntin pattern of the original or historic windows to be removed (on industrial buildings only)</p>	<p>Windows that operate differently than the original or historic windows (for example, a proposal to replace a double-hung window with a casement window)</p> <p>Windows with the grids between the glass</p> <p>Simulated divided light windows without an exterior muntin profile</p> <p>Simulated divided light windows without a spacer bar</p> <p>Metal construction windows (i.e. the entire unit is constructed of metal) (except on industrial buildings)</p> <p>Vinyl , or any non-paintable, synthetic windows</p>	<p>Certificate of Appropriateness & Building Demolition Delay Waiver</p> <p>OR</p> <p>Certificate of Hardship*</p> <p>*Note: A Certificate of Hardship may be issued if an applicant can prove that an appropriate option is not financially feasible for them.</p>

City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

Scenario	Does the Commission have purview?	Can this be appropriate?	Most Appropriate/First Course(s) of Action	Usually Appropriate/Secondary Course(s) of Action	Not Appropriate (typically only permissible with a Certificate of Hardship)	Certificate to be Issued
<p><i>An applicant would like to replace their original or historic aluminum windows, which are visible from the public way</i></p>	<p>Yes</p>	<p>Yes</p>	<p>Repair if possible</p> <p>OR</p> <p>True divided light aluminum replacement windows to match the sash operation type and muntin pattern of the original or historic window to be removed.*</p> <p>*Note: Few major window manufacturers produce true divided light windows, so they typically are custom made. Given the expense associated with true divided light windows, they are rarely used in replacement projects.</p>	<p>Simulated divided light aluminum window with exterior muntin profile and spacer bar to match the sash operation type and muntin pattern of the original or historic window to be removed.</p>	<p>Windows that operate differently than the original or historic windows (for example, a proposal to replace a fixed sash window with a double-hung window)</p> <p>Windows with the grids between the glass</p> <p>Simulated divided light windows without an exterior muntin profile</p> <p>Simulated divided light windows without a spacer bar</p> <p>Wood windows</p> <p>Vinyl , or any non-paintable, synthetic windows</p>	<p>Certificate of Appropriateness & Building Demolition Delay Waiver</p> <p>OR</p> <p>Certificate of Hardship*</p> <p>*Note: A Certificate of Hardship may be issued if an applicant can prove that an appropriate option is not financially feasible for them.</p>
<p><i>An applicant would like to replace their original or historic steel windows, which are visible from the public way</i></p>	<p>Yes</p>	<p>Yes</p>	<p>Repair if possible</p> <p>OR</p> <p>True divided light steel or aluminum* replacement windows to match the sash operation type and muntin pattern of the original or historic window to be removed.**</p> <p>*Note: Aluminum may be a more advantageous choice, given that it provides a similar appearance to steel, but is less corrosive.</p> <p>**Note: Few major window manufacturers produce true divided light windows, so they typically are custom made. Given the expense associated with true divided light windows, they are rarely used in replacement projects.</p>	<p>Simulated divided light steel or aluminum* window with exterior muntin profile and spacer bar to match the sash operation type and muntin pattern of the original or historic window to be removed.</p> <p>*Note: Aluminum may be a more advantageous choice, given that it provides a similar appearance to steel, but is less corrosive.</p>	<p>Windows that operate differently than the original or historic windows (for example, a proposal to replace a fixed sash window with a double-hung window)</p> <p>Windows with the grids between the glass</p> <p>Simulated divided light windows without an exterior muntin profile</p> <p>Simulated divided light windows without a spacer bar</p> <p>Wood windows</p> <p>Vinyl , or any non-paintable, synthetic windows</p>	<p>Certificate of Appropriateness & Building Demolition Delay Waiver</p> <p>OR</p> <p>Certificate of Hardship*</p> <p>*Note: A Certificate of Hardship may be issued if an applicant can prove that an appropriate option is not financially feasible for them.</p>

City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

Scenario	Does the Commission have purview?	Can this be appropriate?	Most Appropriate/First Course(s) of Action	Usually Appropriate/Secondary Course(s) of Action	Not Appropriate (typically only permissible with a Certificate of Hardship)	Certificate to be Issued
<i>An applicant would like to eliminate window opening(s)</i>	Yes	Not usually	The most appropriate course of action would be to retain the original opening.	If there is a good reason why an opening must be enclosed, the original window, or a false exterior window to match that which was removed, should be installed over the enclosure to maintain the massing, window to wall proportions, and symmetry of the building.		Certificate of Appropriateness & Building Demolition Delay Waiver
<i>An applicant would like to create new window opening(s)</i>	Yes	Not usually	The most appropriate course of action would be to avoid creating new openings. If the opening proposed is to accommodate an addition to the building, refer to guidance on additions.	If there is a good reason why a new opening must be created, the Commission must ensure that the placement of the window will not greatly alter the massing, wall to window proportions, or symmetry of the building.		Certificate of Appropriateness & Building Demolition Delay Waiver

City of Worcester Historical Commission Design Review Guidelines for Local Historic Districts



Windows

Bibliography

McAlester, Virginia, and A. Lee McAlester. *A Field Guide to American Houses*. Knopf, 2013.