

GREENON REBATES HERITAGE WINDOW RESTORATION GUIDELINE

INTRODUCTION

The intent of the GreenON Rebates Program for Heritage Window Restoration is to encourage the repair and/or restoration of windows in homes on properties designated or otherwise protected under the *Ontario Heritage Act* (Qualified Heritage Homes). Protected properties under the *Ontario Heritage Act* include: (1) individual designation; (2) located in a Heritage Conservation District; (3) listed on a municipal Heritage Register; or (4) protected by a heritage conservation easement held by the municipality or the Ontario Heritage Trust. This program covers a range of housing types from single family detached and semi-detached homes.

The purpose of this document is to provide GreenON Heritage Window Restoration Participating Contractors (GreenON Participating Contractors) with recommendations and best practices for heritage window restoration work as well what is required to qualify for the GreenON Rebates for Heritage Window Restoration incentives. Homeowners can use this document as reference to guide their conversations with GreenON Participating Contractors and their role in the project.

Section 1: Heritage Window Restoration provides recommended step-by-step guidance on completing heritage window restoration work from building research to project planning to regular maintenance.

Section 2: Heritage Standards & Principles identifies heritage best practices applicable to this rebate program.

Section 3: GreenON Rebates for Heritage Window Restoration Incentive Categories & Requirements outlines requirements for the four categories of window restoration work and the applicable scopes of work. Detailed GreenON Participating Contractor requirements and program rules, including appendices with trade specifications, can be found at <https://greenon.ca/contractor-signup>.

Section 4: References provides information on window restoration including: commonly used terms, illustrations showing typical window types and construction, and helpful online resources. All underlined titles in this document are hyperlinked. The sources are listed in this section.

SECTION 1: HERITAGE WINDOW RESTORATION

Windows are a significant architectural feature of any building. Their design, configuration, shape, operation, materials, and craftsmanship speak to the architectural style and character of the building. In addition to providing aesthetic character, windows are devices that provide natural lighting and often natural ventilation. Maintaining windows in a state of good repair contributes to the overall performance of the building – energy efficiency, ventilation and lighting. Window maintenance and repairs can help to achieve goals related to both heritage conservation and sustainability. Understanding this in the context of a building’s overall performance is an important part of the assessment process under this program. The operating characteristics of historic windows are of significant heritage value that is important to preserve or restore (see Section 4 Resources: [Building Resilience](#), pp. 72).

In deciding the window repair scope of work, the following heritage conservation decision-making process is recommended. These steps are done by the homeowner, heritage expert, and/or GreenON Participating Contractor.

RESEARCH & ANALYSIS

The first step is to gain a comprehensive understanding of the window’s heritage value and existing conditions.

1. Review the heritage designation by-law or easement agreement

Heritage buildings are protected for historical, architectural and/or contextual value. Each designated heritage property is protected by municipal by-law with a description of its cultural heritage value and heritage attributes that should be protected. Individual properties fall under a Part IV heritage designation by-law. Buildings within a heritage conservation district are protected under a Part V heritage designation by-law. Heritage conservation districts typically have an accompanying plan setting out a statement of cultural heritage value or interest, and a description of heritage attributes of the district and of the properties in the district. Work on properties in a district must be done according to the district's guidelines or alteration controls, as applicable.

The Municipal Heritage Register also includes other properties of cultural heritage value or interest that may not be designated. Additionally, heritage properties may be protected by a heritage conservation easement held by the municipality or the Ontario Heritage Trust. Such easements are registered on title.

Review the heritage designation by-law or easement agreement for the property to understand its cultural heritage value or interest and to determine its heritage attributes. To obtain a copy of the heritage designation by-law or listing for the property, contact the municipal clerk or the Ontario Heritage Trust (not all municipalities have a heritage planner) to access the [Ontario Heritage Act Register](#). Further, contact the Ontario Heritage Trust for information on [conservation easements](#).

2. Research the house

Undertake research at the local library and archives (look at historic photos) to understand the original appearance of the house, the windows’ contribution to ventilation, and to verify if the existing windows have heritage value. Examples include, but are not limited to, original or historic

windows that reflect the style of the house and are examples of fine craftsmanship.

3. Evaluate the existing window condition

Undertake an on-site investigation to assess the existing condition of the windows on a unit-by-unit basis. The assessment should investigate the whole window system, including its surround, to ensure it is in good repair. Deterioration is commonly the result of: wear and tear; lack of maintenance/painting; moisture infiltration; insects; and inappropriate alterations. The surrounding wall construction may also require select repairs to improve the air tightness at the wall-window connection and to allow for positive drainage away from the window.

This is also the time to test for hazardous materials. For instance, the use of lead paint was common well into the 20th century and repairs that disturb lead paint may put occupants and workers at risk. In the case of lead paint, the restoration work will need to allow for the remediation and disposal of lead paint in accordance with [Ministry of Labour Health and Safety requirements](#).

This information will inform the window repair scope of work.

PROJECT PLANNING

The second step is to use the findings of the research and analysis to determine the window restoration scope of work. This planning serves to balance heritage conservation with sustainability upgrade goals with an aim to minimize the impact of the work of the heritage attributes of the building.

4. Identify all project requirements

When considering window restoration work, identify all requirements and restraints related to this work. These may include: establishing building performance goals; fire code requirements; security upgrades; budget estimate; and local approvals.

5. Determine the repair and/or restoration scope of work and budget

Develop a full repair scope of work and budget estimate. The scope of work should be based on the existing window conditions and the overall project requirements. It is important to consider all details, such as where to source specific materials or products, and delivery times.

6. Obtain a Heritage Permit

Work supported by this program may be subject to municipal council consent under the *Ontario Heritage Act*. The homeowner, or applicant on behalf of the homeowner, must contact the municipality to determine if a Heritage Permit is required and, if required, obtain a Heritage Permit Application form and information on the approval process. The homeowner must submit for a Heritage Permit as required.

For easement properties, follow any requirements for easement holder (municipality or Ontario Heritage Trust) approval as detailed in the easement agreement.

COMPLETE THE WINDOW REPAIR WORK

The final step is to proceed with the heritage window restoration work.

7. Complete the window restoration work

To be eligible for the GreenON Rebates program, the heritage window restoration work must be completed by a GreenON Participating Contractor in line with the GreenON Rebates program requirements. See Section 3 for a description of the eligible restoration measures. A copy of the program rules and appendices with trade specifications is available at <https://greenon.ca/contractor-signup>.

8. GreenON Rebates incentive application

The GreenON Rebates Participating Contractor must prepare and submit the GreenON Rebates application once the project is complete.

9. Commit to a regular maintenance program

Following the completion of the window restoration work, homeowners should establish a maintenance program to keep the windows in good working order. A window maintenance program generally includes:

- Once a year, complete a visual review of the windows.
- Based on the findings of the review, undertake repairs to remediate deterioration and maintain window operability. Typical repairs include: painting; replacing damaged glass; replacing sealant / weather stripping; balancing sash weights; etc.
- Remove and store non-permanent or seasonal use storm windows during the fair-weather months. When removing storms to put into storage, review their condition and undertake minor repairs as needed.

SECTION 2: HERITAGE STANDARDS & PRINCIPLES

The GreenON Rebates for Heritage Window Restoration supports repair and maintenance work undertaken in keeping with heritage best practices, and specifically:

- Parks Canada [Standards and Guidelines for the Conservation of Historic Places in Canada](#);
- Ministry of Tourism, Culture and Sport's [Eight Guiding Principles in the Conservation of Built Heritage Properties](#); and
- Ontario Heritage Trust: [Well-Preserved: The Ontario Heritage Foundation's Manual of Principles and Practice for Architectural Conservation](#).

When undertaking window maintenance or repairs, the following best practices are to be followed:

Respect for Documentary Evidence

Develop a window repair scope of work based on a comprehensive understanding of the original window design and construction, and the condition of the existing window(s). Consideration should also be given to the windows' role within the performance of the building.

Respect for Historical Material

Apply a minimal intervention approach to window repairs. As much as possible, repair rather than replace original window elements.

Respect for Original Fabric

If a window component is found to be "beyond reasonable repair", provide a replacement piece that matches the original in design, materials, size, proportion and detailing. Repairs should match the existing, both visually and physically.

Sustainability Considerations

When considering energy efficiency upgrades to windows, consider the building envelope and system as a whole. When installing a new element, such as an interior storm, work with a specialist to develop a design that will not impact or damage the historic windows or adjacent building fabric.

Maintenance

Develop and implement a regular maintenance routine to ensure the long-term upkeep of the windows. This may include: an annual review of the windows to identify areas of deterioration for repair in the short-term; and general cleaning.

SECTION 3: HERITAGE WINDOW RESTORATION CATEGORIES & REQUIREMENTS

The GreenON Rebates for Heritage Window Restoration is divided into four incentive categories, covering basic window repair and general upkeep needs, to the completion of significant repair work. The intent of these repairs is to restore heritage windows into good working order, improve the overall thermal performance of the windows and allow for natural ventilation. This rebate program does not apply to replacement windows or repairs to the adjacent wall construction.

The following descriptions outline the requirements for each incentive category. Detailed GreenON Rebates program rules, including appendices with trade specifications, can be found at <https://greenon.ca/contractor-signup>.

1. Weatherproofing

The intent of general window maintenance work is to complete repairs, such as new sealants and weather stripping, that improve overall performance of the window, but that do not require the removal of the window. For instance, over time the sealant joint between the window and wall assembly is subject to wear and can show deterioration in the form of cracking or separation from the adjacent surface. These cracks develop into small gaps which allow for drafts. Similarly, gaps between the window and the frame are vulnerable to air infiltration.

The selection of a compatible sealant should consider the existing conditions such as adjacent surfaces, joint width and environment, and be installed in a reversible manner. Further, the colour of the sealant should complement the existing building.

In the selection of weather stripping, consider its location, visibility, installation method and durability. For instance, brass strips are generally very durable and concealed from view, however, they require some diligence during installation to ensure the window operates smoothly.

Applicable work within this category includes the following repairs to deteriorated elements:

- Provide new sealant along the perimeter of the window frame (exterior)
 - o Cut out the existing sealant or mortar joint between the window frame and the adjacent wall (lintel, jamb and sill).
 - o Fill any open cavities between the window frame and the wall with low expansion spray foam insulation. Be careful not to fill the cavities that hold the weights for hung windows.
 - o Install backer rod or bond breaker tape (sized to suit) in order to prevent three side adhesion of sealant.
 - o Provide sealant at this joint. The sealant should be slightly concave and tooled to the same plane as the front of window. Care should be taken to make sure sealant does not bleed onto the exterior cladding.

- Provide new sealant at the perimeter of the window frame and trim (interior)

- o Remove any existing sealant between the window frame and the adjacent wall (lintel, jamb and sill) and around the window trim.
- o Provide sealant at these joint(s). The sealant should be slightly concave and tooled to sit discreetly at this seam. This sealant can be paintable to allow for finishing.
- Provide new weather stripping
 - o Remove existing weather stripping from the sash or casement.
 - o Install new weather stripping at the top, bottom and sides of the window sash or casement.

This section does not allow sealing the window sash or casement shut; windows are to be restored to full operability. If there are gaps between the sash or casement and the window frame, review the window hardware to ensure it is in good working order and repair / replace broken or faulty mechanisms.

2. Window Sash or Casement Restoration

The intent of window sash or casement repair work is to bring these moving window elements into good working order. Common causes of window sash and casement deterioration are lack of regular maintenance, moisture, and insects. This deterioration reduces the quality of the overall window performance and appearance. These repairs require the removal of the window sash or casement for repair in a workshop or controlled environment.

Applicable work within this category includes the following repairs to deteriorated elements:

- Remove the window sash or casement while leaving frame in place. Provide temporary protection within the window opening.
- In a workshop setting or controlled environment, undertake select repairs to the wood or metal window sash or casement.
 - o Undertake repairs to the wood elements: piece-in or Dutchman repairs; wood consolidation; wood putty repairs; and surface treatments (such as the application of linseed oil).
 - o Undertake repairs to the metal elements: piece-in or Dutchman repairs; removal of rusted areas to sound metal; metal filler repairs; and surface treatments (such as the application of a rust convertor).
- Restore the glazing: Remove the existing glazing putty and glass panes; clean glazing rebate and prepare for reglazing; and reglaze with original glass or (if damaged) new glass.
- Consider installing transparent low-e film on the glass to increase the insulation value of the window, in conformance with any Heritage Permit or other requirements. Window films can be applied to both existing and new glass, are transparent. UV protection is also available.
- Repaint windows: Prepare window sash or casements for painting. Remove loose or flaking paint down to sound substrate; prime (1 coat); and paint (2 coats minimum).
- Install weather stripping.
- Repair existing window hardware and/or provide new window hardware to match existing. Hardware may include: locks; sash lifts; sash cords, weights and rollers; and/or casement latches, flush bolts, and hinges.

- Reinstall window sash or casement in original frame. Fitting the window and adjusting the stops so that the sash fits snug without binding.

3. Window Assembly Restoration

The intent of window assembly repair work is to restore the full window unit – the frame as well as the sash or casements. Similar to option 2, this work requires the removal of the window sash or casement for repair. In most cases, the frame may be repaired in place. In cases of significant deterioration, the frame may be removed in order to facilitate a full repair and then be re-installed.

Applicable work within this category includes the following repairs to deteriorated elements:

- Remove the window sash or casement while leaving frame in place (preferred). Provide temporary protection within the window opening.
 - Undertake repairs to the wood elements of the frame: piece-in or Dutchman repairs; wood consolidation; wood putty repairs; and surface treatments (such as the application of linseed oil).
 - Undertake repairs to the metal elements of the frame: piece-in or Dutchman repairs; removal of rusted areas to sound metal; metal filler repairs; and surface treatments (such as the application of a rust convertor).
- In a workshop setting or controlled environment, undertake select repairs to the wood or metal window sash or casement.
 - Undertake repairs to the wood elements of the sash or casements: piece-in or Dutchman repairs; wood consolidation; wood putty repairs; and surface treatments (such as the application of linseed oil).
 - Undertake repairs to the metal elements of the sash or casements: piece-in or Dutchman repairs; removal of rusted areas to sound metal; metal filler repairs; and surface treatments (such as the application of a rust convertor).
- Restore the glazing: Remove the existing glazing putty and glass panes; clean glazing rebate (i.e. part of the frame that receives glass) and prepare for reglazing; and reglaze with original glass or (if damaged) new glass.
- Consider installing transparent low-e film on the glass to increase the insulation value of the window, in conformance with any Heritage Permit or other requirements. Window films can be applied to both existing and new glass, are transparent. UV protection is also available.
- Repaint windows: Prepare window frames, sash and/or casements for painting. Remove loose or flaking paint down to sound substrate; prime (1 coat); and paint (2 coats minimum).
- Install weather stripping.
- Repair existing window hardware and/or provide new window hardware to match existing. Hardware may include: locks; sash lifts; sash cords, weights and rollers; and/or casement latches, flush bolts, and hinges.
- Reinstall window sash and casements in original frame. Fitting the window and adjusting the stops so that the sash fit snug without binding.
- Provide perimeter sealant on the exterior and interior.

4. Storm Windows

The scope of the storm window repair work may include one of the following approaches: restore the original exterior storm window; provide a new exterior storm window to replace a missing or damaged storm window; or provide a new interior storm window.

The storm window is an important component of the full window assembly. Traditionally, an exterior storm window provides weather protection for the window during the colder seasons as well as improving the thermal performance of the window assembly. Storm windows are available in two designs- fixed in place and operable. An operable storm window maintains the natural ventilation potential of an operable heritage window and includes a workable insect screen. These screens can be designed to be seasonably interchangeable or they can be designed to work with permanently fixed but operable storm windows.

While the installation of a removable exterior storm window (one that is installed on a seasonal basis) is a tried and tested practice, the successful introduction of an interior storm needs to thoughtfully respond to the performance and design of the existing heritage window. Interior storm windows are typically fixed units that serve to reduce drafts and improve the R-value of the window assembly. A fixed unit does not promote natural ventilation through the house and, over time, condensation may develop between the two windows due to lack of air circulation. While these fixed units are generally removable for periodic maintenance, condensation that accumulates on the interior side of the heritage window may lead to moisture damage in the form of peeling paint, wood deterioration and/or rust. When pursuing an interior storm option, work with a Qualified Person to ensure it will perform consistent with the heritage conservation principles.

Applicable work within this category includes the following repairs to deteriorated elements:

- Restore the exterior storm window.
 - In a workshop setting or controlled environment, undertake select repairs to the wood or metal storm window.
 - Undertake repairs to the wood elements of the storm window: piece-in or Dutchman repairs; wood consolidation; wood putty repairs; and surface treatments (such as the application of linseed oil).
 - Undertake repairs to the metal elements of the storm window: piece-in or Dutchman repairs; removal of rusted areas to sound metal; metal filler repairs; and surface treatments (such as the application of a rust convertor).
 - Restore the glazing: Remove the existing glazing putty and glass panes; clean glazing rebate (i.e. part of the frame that receives glass) and prepare for reglazing; reglaze with original glass or (if damaged) new glass.
 - Consider installing transparent low-e film on the glass to increase the insulation value of the window, in conformance with any Heritage Permit or other requirements. Window films can be applied to both existing and new glass, are transparent. UV protection is also available.
 - Replace damaged insect screen.
 - Clean out the vents and provide insect screen to allow for ventilation. As needed, provide a kerf or weeping hole at the base of the window to allow for condensation between the windows to drain.
 - Repaint windows: Prepare window frames, sash and/or casements for painting. Remove loose or

- flaking paint down to sound substrate; prime (1 coat); and paint (2 coats minimum).
- Repair existing window hardware and/or provide new window hardware to match existing. Hardware may include: turn buttons, butterfly clips, hangers, and/or hook and eye fasteners.
- Fasten the storm window into the window frame.
- During fair-weather months, remove nonpermanent storm windows and store them in a secure covered location, free from damage due to moisture, vermin/insects or impact.
- Provide a new exterior storm window
 - Where possible, fabricate the new exterior storm window to match an original sample. New storm windows shall include all window elements: the fixed sash with vents with insect screen; glazing; hardware, etc.
 - If an original is not available, design the new storm window based on a traditional storm window design and with reference to the existing heritage window. The new storm should match or complement the design, materials and detailing of the heritage window in conformance with Heritage Permit requirements.
 - Review the existing window frame to ensure the new storm fits within the existing storm rebate (i.e. part of the frame that receives glass) (as applicable). If the frame does not have a rebate, provide or ensure appropriate support to suit.
 - Fasten the storm window into the window frame. Ensure vents are in good working order.
 - During fair-weather months, remove non-permanent storm windows and store them in a secure covered location, free from damage due to moisture, vermin/insects or impact.
- Provide a new interior storm window
 - Review the existing heritage window and building conditions with a Qualified Person to determine the design parameters of a new interior storm window. The final window design should allow for the ventilation of the air cavity between the heritage window and the new interior storm, and mitigate the possibility of deterioration due to condensation accumulating on the interior side of the heritage window.
 - The new interior storm will need to be sized to suit the existing window frame and should be operable (where applicable) to allow for natural ventilation, and removable for general cleaning and maintenance.
 - When selecting a new interior storm window, preference should be given to models that are visually compatible with the heritage windows. Consult with interior storm window suppliers to best understand the options available. Seek out suppliers experienced with heritage building construction and appropriate sustainability approaches.
 - In tandem with the installation of the new interior storm, undertake modifications to the heritage window to allow for natural ventilation and passive removal of condensation (as required).

SECTION 4: REFERENCES

GLOSSARY

“Beyond Reasonable Repair”: when the severity of the deterioration makes repair of a building component unfeasible or not advisable for safety or structural concerns.

“Conserve”: the process of identifying, protecting, using, and/or managing cultural heritage resources in such a way that retains their heritage value. “Conserving” and “conservation” have corresponding meanings.

“Heritage Attributes”: the physical features or elements that contribute to a property’s cultural heritage value or interest, and may include the property’s built or manufactured elements, as well as natural landforms, vegetation, water features, and its visual setting.

“Qualified Heritage Home”: a home with a heritage designation or otherwise protected under the *Ontario Heritage Act* that qualifies for the GreenON Rebates for Heritage Window Restoration incentives. Protected properties under the *Ontario Heritage Act* include: (1) individual designation; (2) located in a Heritage Conservation District; (3) listed on a municipal Heritage Register; or (4) protected by a heritage conservation easement held by the municipality or the Ontario Heritage Trust.

“Qualified Persons”: individuals – professional engineers, architects, building specialists, etc. – having relevant (e.g., of the same type), recent experience in the conservation of cultural heritage resources.

“Restoration”: the action or process of accurately revealing, recovering or representing the state of an historic place, or of an individual component, as it appeared at a particular period in its history.

ONLINE RESOURCES

Federal Provincial Territorial Historic Places Collaboration (FPTHPC). 2016. [Building Resilience: Practical Guidelines for the Sustainable Rehabilitation of Buildings In Canada.](#)

Fram, Mark. 1992. [Well-Preserved: The Ontario Heritage Foundation’s Manual of Principles and Practice for Architectural Conservation.](#) Toronto: Stoddart Publishing Co., Ltd.

National Park Service, U.S. Department of the Interior. 1981. [Technical Preservation Services, Preservation Brief 9: The Repair of Historic Wooden Windows.](#) Technical Preservation Services. National Park Service, U.S. Department of the Interior.

Parks Canada. 2010. [Standards and Guidelines for the Conservation of Historic Places in Canada.](#)

Province of Ontario, Ministry of Tourism, Culture and Sport. 2007. [Eight Guiding Principles in the Conservation of Built Heritage Properties.](#)

Province of Ontario, Ministry of Tourism, Culture and Sport. 2006. [Ontario Heritage Tool Kit.](#)

WINDOW DIAGRAMS

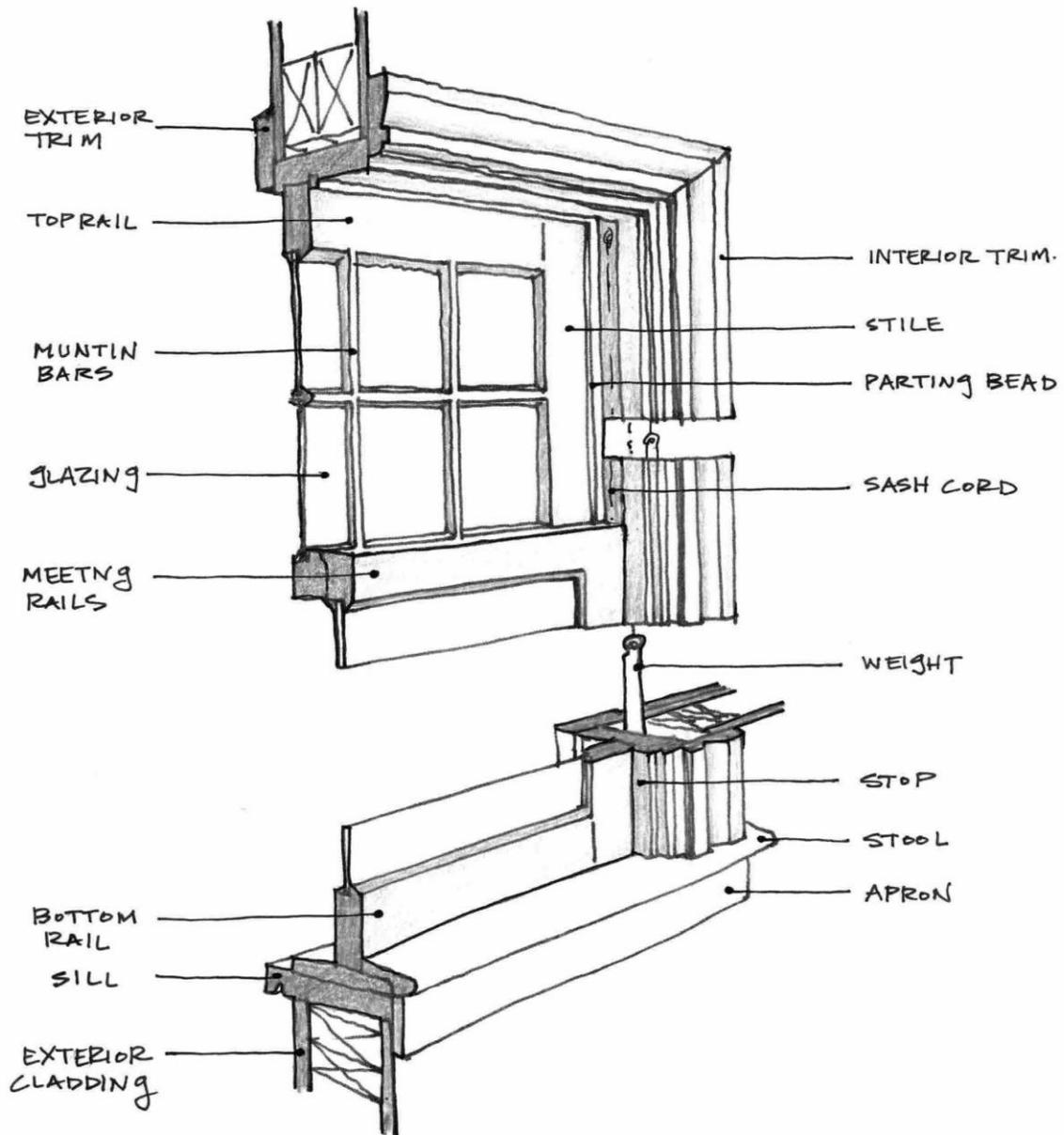


Figure 1: Diagram of a double hung wood window (as viewed from interior).

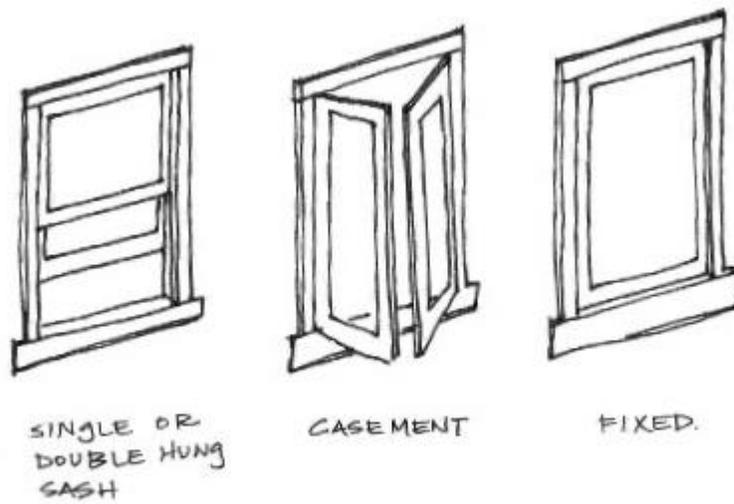


Figure 2: Typical window types.

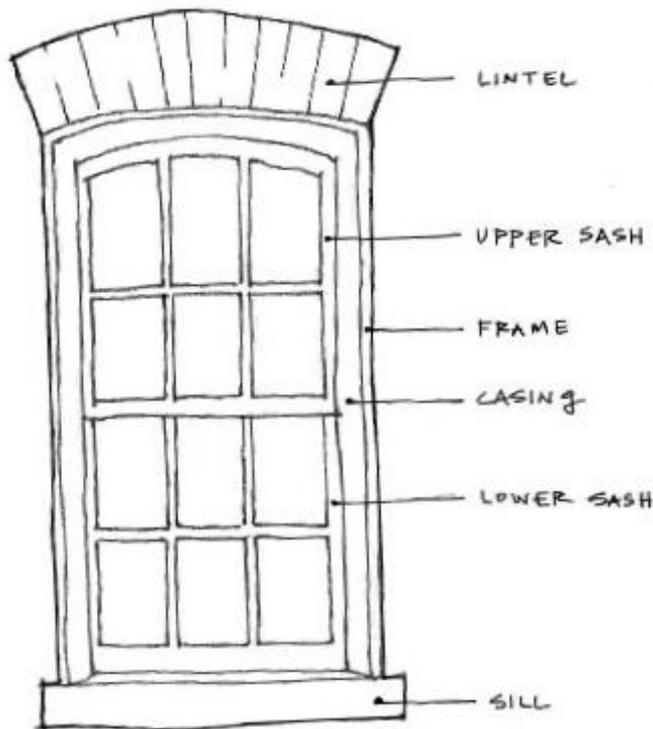


Figure 3: Window diagram (as viewed from exterior)