

SAINT JOHN HERITAGE CONSERVATION AREAS

Windows

INTRODUCTION

In addition to providing light, outside views, and ventilation, windows are an important design element of a building facade. Their location, size, shape and style work together help to define a building's architectural character. Unfortunately, windows are the feature of a facade that in the recent past have most often been changed.

Windows are constructed of various components such as frames, sashes, glazing, flashings, and hardware. Many historic buildings may also have related window components such as storm windows, decorative glazing, grilles, shutters, etc., which should be considered when assessing the windows.

If an original window has deteriorated to the extent that it requires replacement, the new window should replicate the original. However, before deciding what to do with a window, carefully inspect it to determine what work is necessary. Check the operation of the sash, the condition of the glass and putty. Make sure that the drainage of rainwater and condensation is adequate. Look for rot, warping and wear. Inspect the paint and the hardware. Check for air infiltration on a windy day, and examine the weather-stripping for wear and deterioration.

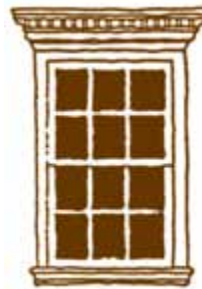
If you find some problems, identify the cause (some problems may be unrelated to the window).

WINDOW STYLES

Each style of building is characterized by a different style and configuration of windows and doors. The shape of the opening, the divisions within it and the surrounding trim all contribute to the building's stylistic character.

GEORGIAN pre 1800-1830

Large double-hung.
Symmetrically placed.
Often with shutters.
Simple trim.



GREEK REVIVAL 1830-1860

Large double-hung.
Symmetrically placed.
Slender muntins.
Pilastered frame.



SAINT JOHN





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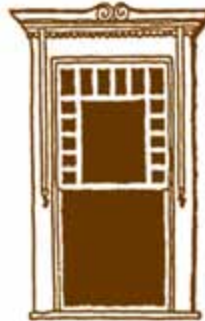
GOTHIC REVIVAL 1850-1870

Large double-hung.
Irregularly placed.
“Pointed” vertical appearance.
Delicate muntins.
Heavy moulded trim.



QUEEN ANNE 1880 – 1900

Multi-shaped.
Irregularly placed.
Often multi-paned or leaded sash.
Playful character.



ITALIANATE 1850-1870

Tall double-hung.
Often rounded head.
Bracketed hood or sill.
Often paired.
Regularly placed.



SECOND EMPIRE 1860-1880

Tall double-hung.
Various shapes.
Ornate mouldings and brackets.
Often grouped and in bays.

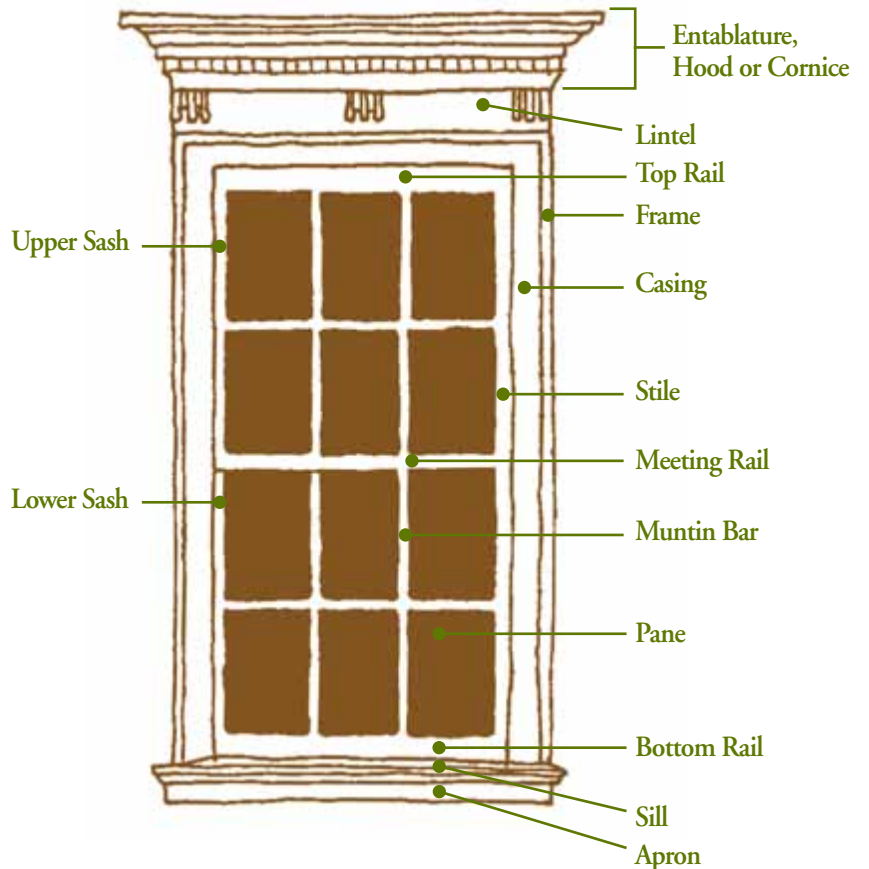


ROMANESQUE 1875-1895

Squat. Often arched.
Usually grouped.
Randomly located.
Mostly in masonry or stone buildings.



PARTS OF A WINDOW





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CONSERVATION APPROACH

Saint John has a rich variety of nineteenth century buildings that form the character of our city. Individually, many of them are excellent examples of particular styles of architecture.

The heritage value of any building is a product of its history, architecture, and contribution to the surrounding neighbourhood.

The treatment of particular building elements such as windows, should be considered in relation to the design of the building as a whole.

It is important to conserve the original historic fabric. Repair, rather than replace deteriorated architectural elements. If replacement is necessary, match the size, materials and detailing of the original windows. Replacement of missing features should be based upon historical evidence.

Recognize buildings as products of their own time, and avoid alterations without historical basis, or that create an earlier appearance. At the same time it may be advisable to recognize that some of the changes which have happened during the life of a building may have significance that should be respected as evidence of the history and development of the building.

The first step in any conservation project is to understand the building. Find out as much as you can about it. Identify its style and its approximate date of construction. Learn about the materials and methods used to build it.

TYPES OF WINDOWS

Traditionally, the most common window type in Saint John was the “double-hung” window. Each of the two sashes which make up this window move independently in the vertical direction and are balanced by counterweights concealed within the jambs. Modern versions incorporate springs or other methods to permit easy operation.

Less common locally was the casement window, in which the openable sash swings outward on vertical hinges like a door.

Horizontally-hinged sash, known as awning or “hopper” windows, are often used in transoms over doors and are common on commercial or institutional buildings.

Sash are usually subdivided into smaller glazed sections by “muntin bars”. These subdivisions are an important component of the window’s style and should be conserved. In Italianate buildings, for example, the upper and lower sash were each subdivided by vertical muntin bars into two glazed sections. These windows can be referred to as a two-over-two, or 2/2 windows. The window shown in the “Parts of a Window” illustration is a Georgian style 6/6 window. Avoid using oversized or “heavy” muntins or snap-in grilles to simulate these divisions in new or replacement sash glazed with insulated glass.

MAINTENANCE

Periodic maintenance will ensure that your windows functions properly, and will conserve them in good condition. Regular washing and regular painting protect windows from the elements, and provide an opportunity for periodic inspection and repairs. Deteriorating putty should be replaced, and perimeter joints caulked to prevent water penetration.

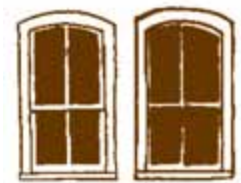
With a program of routine maintenance in place most repairs to sills, sash, frames and muntins are relatively simple.

Cleaning Glass

Use detergent or glass cleaner. If surface grime is tough, a very fine steel wool can be used.

Painting

Exterior paint normally lasts five to eight years. Remove loose and deteriorated paint with heat guns and hand scrapers, sand the surface, scrub with TSP (tri-sodium phosphate) and rinse clean to prepare for new



Yes: Correct sash proportions. Thin muntin bars.



No: Arched top has been removed. Vertical muntin bars have been removed. Original style and proportions have been lost.



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paint. Use a primer-sealer, and paint with two finish coats following the manufacturer's instructions.

In a restoration project, a building owner may want to restore the windows to their original colour. To reveal a window's earliest paint colours scrape a small area, feather sand the edges down to the wood, and examine the sanded area with a magnifying glass. The original colour will be the one in the first concentric ring next to the bare wood in the centre of this sanded area.

Glass Repair

Cracked decorative or historic glass can be repaired in place. Clean the edges with acetone, and apply clear fluid glue to the crack.

To replace broken glass, carefully remove the existing glass. Scrape out all the old putty, and remove the glazier's points. Seal the wood with linseed oil or primer to avoid having the putty's binder leach out into the wood. Cut the new glass 1/8" to 3/16" smaller than the opening. Bed the glass in a thin strip of putty or glazing compound. Tap in glazier's points (one every 6" and at least two per side) with the flat side against the glass. Then put glazing compound or putty around the sash. Smooth it into a triangular shape using a putty knife, and make sure there are no gaps or cracks. After the product has cured, paint over the putty and overlap the paint onto the glass by 1/16".

Putty

Over time putty becomes cracked and loose. Old putty should be removed. To soften it, apply heat from a heat gun. Shield the glass from the heat to avoid thermal expansion and cracking. Remove the softened putty carefully with a stiff knife.

Sill Repairs

Gouge or chisel out all the rotted wood, and treat the area with a preservative. Then fill the cavity with an epoxy filler. Where the area of rot was large the void should be fitted with a 'dutchman', or new piece of wood of the

same material, fitted and glued in place. Newer epoxy consolidants permit repair without removal of all of the rotted material.

Sash Repairs

To straighten sash take them out of the frame by removing the stop and/or parting bead on the sides. If the sash is out of square, the corner joints likely have become loose or rotten. Square up the sash, drill through the two members, insert a hardwood dowel, and glue it in place. If the bottom rail is partially rotted, remove rotted material, plane the surface smooth and screw on new wood.

Muntin Repairs

Minor repairs can be done, using epoxy and wood fillers. More extensive repairs require removal of the glass and replacement of the existing muntin.

Surface Repairs

Small cracks should be cleaned out, primed with linseed oil and then puttied. For minor damage, use plastic wood. For larger areas, use epoxy resin. Drill 1/4" holes at an angle into the rotted area and inject the resin. Then, use a paste of resin and sawdust, to fill and form a smooth surface, as with plastic wood or putty.

Hardware

To replace a sash cord, remove the lower sash. You should find the sash weight pocket hidden by a cover in the frame. Remove the screws and lift out the cover to access the sash weight. Attach the new sash cord. This is also a good opportunity to remove the pulleys to clean and oil them.

Weatherstripping

Air infiltration between sash and window frames accounts for the greatest amount of heat loss. It can be reduced by the installation of a variety of weather-stripping products. Foam strips with a self-adhesive backing are applied directly to moving or fitting parts and are only effective in compression. Foam strips glued to a wood nailing strip are slightly more durable, and can be removed in warmer



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weather. Compressible vinyl or metal strips are effective and durable between sliding surfaces, and are available with a self-adhesive backing. Interlocking felt-lined metal weatherstripping provides the best performance.

Caulking

Use caulking to seal gaps between different materials and between different building elements. Caulking must be able to adhere to the surfaces and should be flexible enough to accommodate movement in the joint.

Large joints should first be filled with a foam backer rod to provide a bed for the caulking. Latex caulk is best used in interior applications. Rubber, butyl and polyurethane caulking will last 15-20 years in exterior applications, and can be painted. Silicone caulk will last over 20 years but cannot be painted. To avoid trapping condensation, upper sash should be caulked only on the interior, NOT the exterior.

Replacement Windows

Only those windows which have deteriorated to the point where they are not repairable should be considered for replacement.

Replacement windows should duplicate the originals in style, type, material and detailing. Custom wood sash can be produced by a local millwork shop and provide a near-perfect match to the original. If an exact duplicate is not possible, install windows with the same materials, sash operation and muntin bar subdivisions

Some replacement windows have features which claim to eliminate traditional maintenance tasks. Any benefits, however, may be outweighed by new and costly long term costs, such as the repair or replacement of balance systems, weather seals and insulated glazing units, which typically fail within 15 years.

Remember that replacement of an entire window will require attention to the surrounding trim and may disturb wall surfaces both inside and outside, at additional costs.

Infilling Openings

Do not change the size, location or number of the existing window openings on the main facades, unless the property is being restored to its original appearance. A bulkhead or valance on the inside can accommodate a lowered ceiling if necessary. In some applications, an opaque upper panel as part of the window may be successful in masking any interior alterations while maintaining the building's original exterior appearance.

Decorative Glass

Coloured, patterned, or bevelled glass was widely used in Saint John for decorative effect and should be preserved. This glass was most often installed using lead came and can be economically repaired locally. Less elaborate designs were created using patterns of wood muntins and were glazed like ordinary windows.

Storm Windows

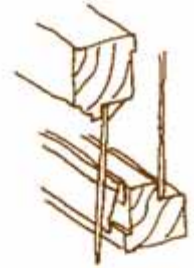
Wooden storm windows, usually removable, are the traditional way to improve the thermal performance of a window. The window pane subdivisions in storm windows should repeat at least the principal subdivisions of the primary windows. Often the storm windows had more and smaller panes.

Storm sash should be attached by hooks to the interior frame or hung from the outside frame. Often the lower rail is pierced to allow for ventilation, which can be controlled with a pivoting wood cover. To ensure a tight fit, add a rubber gasket to the inside face of the storm.

Exterior metal or vinyl storm windows are not appropriate on heritage buildings. The materials, style and proportions of these products are not traditional. Directly fastening the frames of metal storm windows to the existing wood frame and sill can lead to condensation problems.

Consider "permanently" mounting in place the majority of the existing storm windows

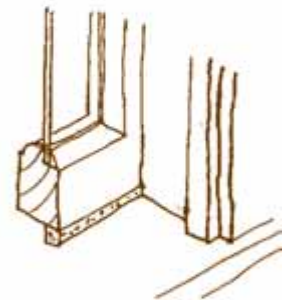
Location of Weatherstripping



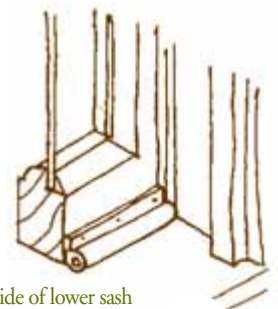
• at junction of upper & lower sash



• on edge of sash



• on underside of lower sash



• on inside of lower sash



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if you can provide ventilation openings during the warm season equal to 5% of the floor area in a room. Caulk the perimeter of the fixed-in-place storm windows, and install weather-stripping on the inside face of the others. Add weep-holes at the bottom of the lower rails to allow condensation to escape. Use screw fastenings to allow for periodic removal for painting and cleaning.

Double-glazing

Both double-glazing and interior storms offer an alternative to exterior storm windows. The inside window should be more tightly sealed than the outside one. To prevent condensation from rotting the wood, add ventilation from the air space to the outdoors.

Before you consider installing sealed insulated glazing units in old sash ensure that the muntins are strong enough to support the heavier glass. Enlarging these supporting elements may destroy the original proportions of the sash. The minimum muntin bar width that will support new double-glazing units and conceal the glass spacer is 7/8".

References

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Magee, Phoebe Anne, And Smith, M. Aileen. *Heritage Handbook*.: St Andrews Civic Trust, 1980

Stephen, George. *Remodeling Old Houses Without Destroying Their Character*. New York: Alfred A. Knopf Inc., 1974

Vila, Bob. *This Old House*. Boston: Little, Brown And Company, 1980

Replacement Windows

Original



Casement

No



Small Pane Missing



Double Hung Sash
6 over 6



6 over 6
Panels Missing



Double Hung Sash
2 over 2



Centre Muntin
Missing

FOR MORE INFORMATION

The Practical Conservation Guidelines, application forms for Grants and Certificates of Appropriateness and other useful information for fixing up your older building is available from:

Heritage Services | Growth and Community Development Services
15 Market Square,
Saint John, New Brunswick | E2L 4L1
Phone: (506) 658 2838

Email: heritage@saintjohn.ca
Online: www.saintjohn.ca/heritage

Property Owners! Contact Heritage Staff before you begin to make any plan purchase supplies or hire contractors. Advice on ways to save you time, money and energy will be offered free of charge.