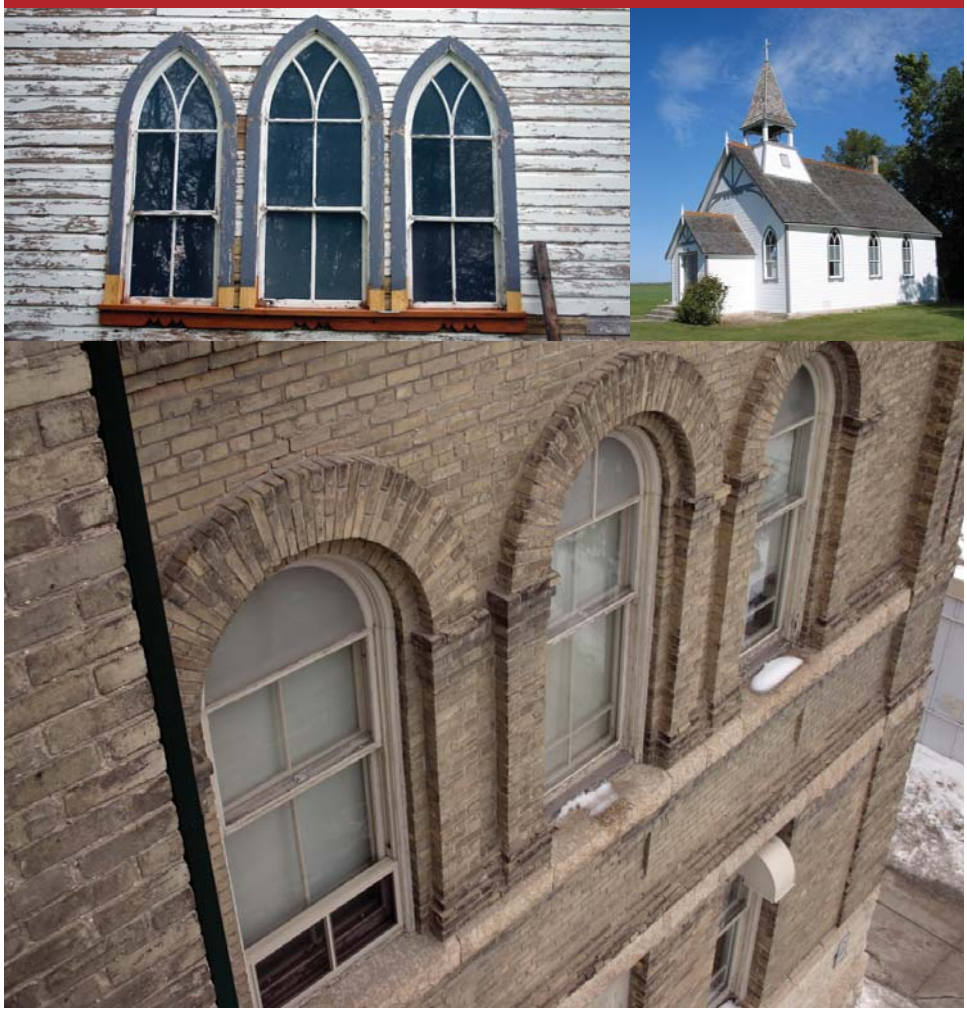

Guidelines for the Repair or Replacement of Windows in Historic Buildings

WINDOWS CONDITION ASSESSMENT

Canada's Historic Places / Lieux patrimoniaux du Canada

Winnipeg

Manitoba

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Image Front Cover: Isbister School, Winnipeg, MB. St. Paul's Anglican Church, St. Francois Xavier area, MB.

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2010

GETTING STARTED

One of the most common practices during renovation is to throw away old original windows. Removing historic windows decreases the heritage value of a historic building and should be a last resort. The Province of Manitoba and the City of Winnipeg have collaborated to prepare these guidelines to assist property owners, contractors and consultants when considering repair or replacement of original wood or metal windows in a historic building.

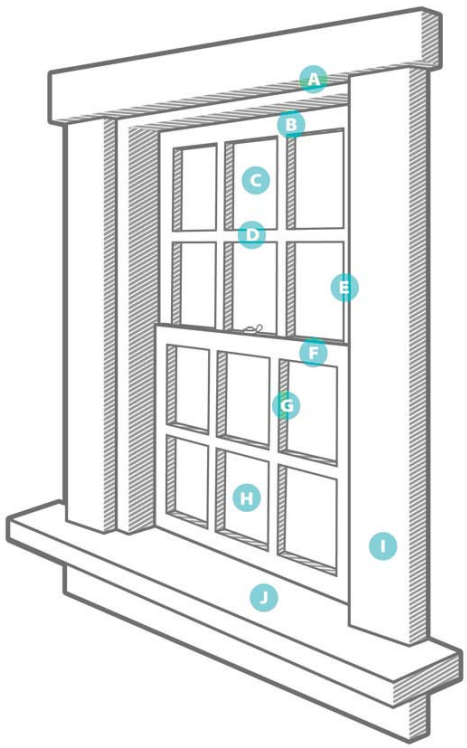
Life-cycle cost analysis has shown that replacing historic windows in order to reduce heating costs is largely a myth. The thermal and acoustic performance of old windows can be greatly improved through simple noninvasive strategies such as weather stripping and installing storm windows. If you are facing operational problems with your old wood windows, it is possible to meet modern performance standards either by repairing and upgrading existing windows or, where this is not feasible, by providing new components that match the original design specifications.

GENERAL GUIDELINES

The City of Winnipeg and the Province of Manitoba support the objective, set forth by the *Standards and Guidelines for the Conservation of Historic Places in Canada,* that preservation and rehabilitation are always preferred over replacement. The first step in considering repair or replacement of windows in your historic building is to evaluate the architectural and historical significance of the windows. Original windows function as an integral part of the building's interior and exterior and contribute to the architectural rhythm of the facade. Removing historic windows negatively affects a building's appearance and the appearance of the entire streetscape. Where windows are original to the building and of special importance they will be included in the designated building's *Statement of Significance*, a brief report on what makes the site special. These can be found on the Canadian Register of Historic Places at www.historicplaces.ca.

ANATOMY OF A WINDOW

Understanding the parts and operation of your windows is the next step in assessing the window condition. Each component will need to be carefully examined. Deterioration should be photographed and images submitted to the appropriate heritage authority along with the Condition Assessment. Your photographs will support your observations. The value assigned to each window reflects whether the overall elements are in Good, Fair or Poor Condition and, in consultation with your local heritage authority, will determine any future changes.



A. Jamb
B. Rail
C. Pane or Light
D. Top Sash
E. Stile
F. Meeting Rail
G. Muntin Strip
H. Bottom Sash
I. Casing
J. Stool

Illustration by mckibillo. Used with permission. Courtesy of PRESERVATION magazine, National Trust for Historic Preservation

EVALUATION STANDARDS

Use the Evaluation Standards below to determine the condition for each historic window listed on the Condition Assessment.

Condition	Description
GOOD	A. The window is intact, structurally sound and performing its intended purpose. B. The window needs no repair and only minor or routine maintenance.
FAIR	A. There are early signs of wear, failure or deterioration, though the window is generally structurally sound and performing its intended purpose. B. There is a failure of a subcomponent of the window. C. Replacement of up to 30% of the window or replacement of a defective subcomponent is required.
POOR	A. The window is no longer performing its intended purpose and cannot be made to do so. B. The window is missing C. Deterioration and damage affects more than 30% of the window and cannot be adjusted or repaired. D. The window shows signs of imminent failure or breakdown

The Historical Windows Condition Assessment will help you to prioritize window repair work and determine which windows may be eligible for replacement. The Evaluation Standards (Good, Fair or Poor) are used to assess the condition of each window. Once the window condition has been determined, Intervention Standards outline the appropriate conservation approach for each window.

INTERVENTION STANDARDS FOR HISTORIC WINDOWS

The following Intervention Standards are based on recommendations from the *Standards and Guidelines for the Conservation of Historic Places in Canada* and are strictly guidelines. Owners of designated heritage buildings in the City of Winnipeg must still apply for a heritage permit from the Planning and Land Use Division. Provincially designated buildings require a permit from the Historic Resources Branch. Municipally designated buildings outside the City of Winnipeg may require a permit from the local municipal government. Consult with your local heritage authority before taking action.

GOOD CONDITION: PROTECT & MAINTAIN

Windows deemed good should be protected and maintained through appropriate surface treatments such as cleaning, rust removal, limited paint removal and reapplication of protective coating systems in kind. Windows should be made weather tight by re-puttying, and replacing or installing weather-stripping.

FAIR CONDITION: REPAIR & STABILIZE

Windows deemed fair require repair and stabilization of deteriorated elements using structural reinforcement, weather protection, or the correction of unsafe conditions, as required, until any additional work is undertaken. Repairs should be physically and visually compatible. Where there are missing parts match replacements to surviving prototypes. Refer to the Windows Guidelines for appropriate treatment of window components.

POOR CONDITION: REPLACE IN KIND

Windows deemed poor may be eligible for replacement in kind. The new work should match the old in form and detailing. Refer to the Windows Guidelines regarding replacement window elements. Contact the City of Winnipeg Planning & Land Use, Heritage Unit, the Historic Resources Branch of the Province of Manitoba, or your local municipal heritage authority to discuss an appropriate replacement window unit.

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CONDITION ASSESSMENT FOR THE REPAIR AND REPLACEMENT OF HISTORIC WINDOWS

A window condition assessment is a careful evaluation of the existing physical condition of your historic windows on a unit-by-unit basis. In addition to the condition assessment, photo documentation is required. Either floor plans or exterior elevations can be submitted illustrating the window number assigned to each window. Work through the list of questions for each window being assessed. When you are finished, assign an overall score to the window of Good, Fair or Poor. When you have completed the assessment, submit the paperwork, plans and photographs to your local heritage authority for review.

WINDOW LOCATION & WINDOW NUMBER: [1]	1 N																		
	1																		
There are no cracked or missing window panes	✓																		
There is no brittle or cracked putty around the glazing	✓																		
The window frame does not curve outwards or show other signs of deformation	✓																		
The sash and window frame align	✓																		
No hardware (screws, bolts, etc) is missing from the window frame or sash	×																		
The frame or sash components do not show decay such as rot or corrosion	×																		
If the window was operable, the sash or sashes still operate. ** Cut paint to ensure windows are not simply painted shut	×																		
If the window has a counter balance, it is operational	n/a																		
The window sill shows no sign of rot, cracking or corrosion	✓																		
The window sill slopes away from the building	✓																		
PHOTO NUMBER: [2]																			
OVERALL WINDOW CONDITION: [3]	F																		

1. Specify window location as: ① first floor, ② second floor, ③ third floor, or ④ fourth floor AND specify façade on which window is located (north, south, east or west)
2. Indicate which photograph corresponds to which window in the Condition Assessment
3. Indicate if the overall window unit is in Good (G), Fair (F) or Poor (P) condition. Refer to Evaluation Standards for assistance.

COMMENTS:

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COMMENTS:

GUIDELINES FOR THE REPAIR AND REPLACEMENT OF WINDOWS IN HISTORIC BUILDINGS

Windows in historic buildings may be eligible for replacement if:

- the original windows no longer exist
- the windows are located on a less visible or less prominent elevation, such as the rear of a building.
- the Condition Assessment and corresponding documentation demonstrate the window is unsalvageable.

WINDOW TYPE

Replacement window types should match the appearance and character of the original window. Best practice dictates that original double-hung windows should only be replaced with new double-hung units. The sizes of sashes and location of meeting rails should match the original windows. Replacement windows should incorporate any special features of the original windows, such as transom windows. Maintain or, if necessary, recover the historic size and shape of all window openings; neither expand the openings nor fill them in, except to make good previous damaging modifications. If interior ceilings are to be lowered with a suspended ceiling ensure that the ceiling drop is set back sufficiently from the windows to enable their visual and functional continuity.

WINDOW FRAMES

Replacement window frames for wooden windows should be of wood construction or of an approved substitute material (See Substitute Materials page 12). Dimensions should match the original windows. Any decorative detailing on the original windows (such as brick mold, lintels, sills and casings) should be accurately duplicated.

SASHES

Replacement sashes for wooden windows should be of wooden construction and dimensions should match the original windows. Any decorative detailing on the original sashes (such as muntins, mullions and sash frames) should be accurately duplicated. The sizes of the sash and location of the meeting rails should match the original windows. The upper and lower sash should be on separate planes to match the original windows. If the window sash is badly deteriorated, replacement units can be made to fit the existing window frame (See Substitute Materials, page 12). Replacements for metal windows should be of metal construction. Replacement windows should incorporate any special features of the original windows.

MUNTINS

Replacement muntins should appear on the outside of the window and, preferably, on the inside as well. Muntins attached only to the inside of the window or between panes of glass are not acceptable. Never add muntins or the appearance of muntins to windows that were originally composed of large sheets of glass. The following muntin replacement techniques are listed in descending order of acceptability:

- true muntins that actually support the glass and extend from the exterior to the interior of the window, providing that the dimensions and profiles of the original muntins can be reproduced
- muntins that match the dimensions and profile of the original muntins applied to the interior and exterior surface of a sealed window unit
- as above but applied only to the exterior of the sealed window unit
- Clip-on plastic muntins are inappropriate and should not be used.

GLASS

Retain historic glass and protect it during repairs. If glass is cracked or missing,

new glass panes can be installed. Cracks smaller than 1" may be monitored and not replaced. Replacement glass should be clear and without tint or mirror-finish. If necessary, Low-E films are acceptable. Laminated security glass is a superior solution to unsightly security grilles or bars, which make maintenance and cleaning more difficult. Clean glass with detergent on rags or newspaper. If there is a considerable build-up of grime, use the finest steel wool available. Rinse off with water. Polish the glass with a chamois or linen rag.

FINISHES

Exterior finishes should match the original window colours (confirm through on-site investigations, paint scrapings, historic research and archival photographs). If the original colours cannot be recovered, repaint in suitable colours that are authentic to the period of the building. The following exterior finish materials are listed in descending order of acceptability:

- paint/stain finish to match original colours
- factory applied paint finish to match original colours
- aluminium clad wooden window frames with a factory finish to match original colours
- aluminium clad wooden window frames with a finish sympathetic to original colours

SUBSTITUTE MATERIALS

Substitute materials will only be considered in circumstances where the appearance is virtually indistinguishable from the original and there is a significant advantage in terms of the availability, cost, performance or durability. Wherever possible, windows that are visually accessible should be made of the same material and visual quality to match the original. Aluminum or fibreglass may be a suitable replacement for a historic wood sash provided the detail of the historic window can be matched. Replacement window frames for steel windows may be of aluminium or fibreglass.

BLIND WINDOWS

If windows are to be blocked because of a major functional change to the historic building, first consider changing the interior layout and, second, look for Building Code alternatives to accommodate the use of the window in its historic form and location. As a last resort, windows should be covered over from the interior, and their exterior appearance as windows maintained. Maintain or if necessary recover the historic size and shape of all window openings. Removing a window is not acceptable.

WEATHERSTRIPPING

The most dramatic and cost-effective energy efficiency improvements are achieved not through replacing windows but by reducing air infiltration (i.e. sealing fixed joints and installing weatherstripping). Weatherstripping should be flexible and spring back to its original shape. Spring bronze is an excellent choice for weatherstripping historic windows as it is durable, easy to install and readily available from historic window suppliers.

STORM WINDOWS

If wooden storm windows exist they should be kept painted and in good repair. If you have single pane wooden windows, consider adding wood storms to protect your original windows and increase energy efficiency. Interior storms may also a good alternative; they are often cheaper than exterior storms and can be made to fit on the sash or the window trim. Aluminum storms and screens are not recommended if they obscure the original windows. However, they maybe acceptable to improve energy efficiency. Consult with your designation authority.

HARDWARE (SASH LOCKS, SASH COUNTERWEIGHTS, SASH LIFTS, ETC.)

Wherever possible:

- salvage, repair and clean original hardware and reuse on the replacement frames

REPLACEMENT WINDOWS

If the degree of deterioration necessitates the replacement of windows, authentic replacement units are recommended. Replacement windows should match the original windows in size, shape, material, proportions, profiles, reveal and glazing type. It is important that every effort be made to match the style, muntin grids, size and profiles of elements. Blocking up a window, that is, removing the sash and frame and filling in the opening, should never be considered on a primary façade or visible side elevation. Replacement of windows on primary or secondary building elevations is not recommended. However, the back of the building is traditionally an area that allows flexibility. Original appearance, dimensions and detailing should be confirmed through:

- remnants of the original windows
- archival photographs
- original architectural drawings

REFERENCE MATERIAL

The following resources provide additional information on repairing historic windows:

Leeke, John. *Save Your Wood Windows* Practical Restoration Report. Historic Homeworks, 2004.
www.historichomeworks.com

Park, Sharon C. *The Repair and Thermal Upgrading of Historic Steel Windows.* Preservation Brief #13, US National Park Service, US Department of the Interior, 1984.
http://www.nps.gov/hps/TPS/index.htm

Sims, Craig and Andrew Powter. *Maintenance and Repair of Historic Wood Windows.* Heritage Canada Magazine, Summer 2006.
www.heritagecanada.org

For more information on the *Guidelines for the Repair or Replacement of Windows in Historic Buildings* or the *Windows Condition Assessment* please contact:

City of Winnipeg
Planning & Land Use Division
Planning, Property and Development Department
15 - 30 Fort Street
Winnipeg, MB R3C 4X5
tel: 204-986-4722
fax: 204-986-7524
www.winnipeg.ca/ppd

Province of Manitoba
Historic Resources Branch
Manitoba Culture, Heritage, Tourism and Sport
Main Floor, 213 Notre Dame Ave.
Winnipeg, MB R3B 1N3
tel: 204-945-5809
toll free: 1-800-282-8069-2205
fax: 204-948-2384
www.manitoba.ca/heritage