



City of Charlottetown

GUIDELINES
for the
REPAIR and REPLACEMENT
of HISTORIC WINDOWS
in Charlottetown
Prince Edward Island



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For:
The City of Charlottetown
Planning Department
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Canada's
Historic Places

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du Canada



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Forward



City of Charlottetown

Windows are often referred to as the eyes of a building and are an important design feature of each style of building. Charlottetown is fortunate to have retained many original windows and where necessary replacements have often been carefully considered.

I hope these Windows Guidelines will encourage property owners to retain and repair windows where possible before considering the options for replacement.

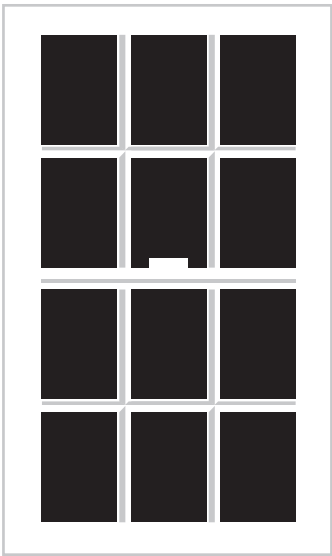
I compliment the caretakers of Charlottetown's Historic Resources for ensuring the long term viability of the windows and the dramatic effect they have on the buildings and streetscapes of our city.

Kim Devine

Chair

Planning & Heritage

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Introduction



A building's windows enable an otherwise dark room to be flooded with natural light; they let in cool breezes on a hot day and they allow us to see the world beyond our walls. In addition to serving such practical functions, however, windows help to define and express the style and architectural period of a building through such details as moulding profiles, function, size, shape, position and glazing patterns. Retaining the original windows is one of the best ways to retain the charm and character of an older building. Far too often, the assumption is made that replacement windows will be more attractive, less expensive, more energy efficient and require less maintenance. Upon further consideration, however, many of these assumptions reveal themselves to be unfounded and restoring or rehabilitating existing windows becomes a more deserving option.

The City of Charlottetown encourages the retention, repair and thermal upgrade of original windows in historic buildings. The purpose of this Guide is to assist property owners and contractors in evaluating existing windows, repairing them whenever possible or, if their condition is completely beyond repair, replacing them with suitable new windows. This Guide should be seen as one of a number of resources available to assist in the decision-making process and increase awareness of the options at hand.

Know Your Building



Many of us live in or otherwise experience buildings every day without giving much thought to their design or exactly how well the parts were chosen and assembled. In some buildings, we may notice that things just seem to be in the right places and we feel calmness and stability. Other buildings may seem as though something is missing or that all the parts haven't really come together leaving us feeling anxious or unsettled. Good design will not only function well but will aesthetically express a particular style.

The historic identity of a building is determined by many different elements; the general size and shape of the building, how it is positioned on the site, the combinations of stone, brick, shingle or clapboard which clad its exterior, the steepness and profile of its roof, its trims, colours and details, and the distribution and style of its doors and windows. The most successful buildings tend to be those where every decision has been guided by a desire to express that chosen style. Good descriptions of the most common architectural styles found in Charlottetown can be found in the "Design Guidelines for the Preservation of Historic Resources in Charlottetown, PEI" produced by the City in 1992. Whether it has the simplicity of a Maritime Vernacular Cottage or the complex forms of a Queen Anne Revival, a building's look is determined by a code of details and characteristics which are specific to that style. Before making

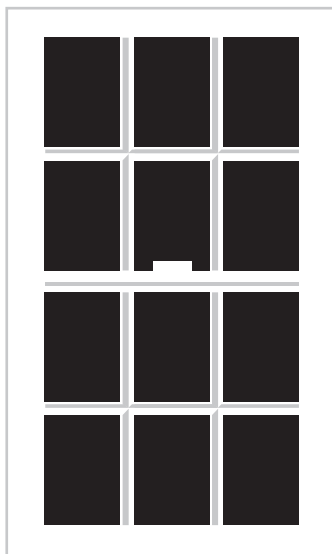


any design decisions about a building, it is important to recognize its style and to understand what qualities define the style. This can be especially important when considering the windows. Few components contribute so much to the aesthetics of a building or do so much to express its character. While every building is unique, knowing how windows would generally be expected to appear on a certain style of building can help greatly to make the right decisions when renovating.

It may help to seek out early photographs or drawings of your building or ones of similar style. The PEI Museum and Heritage Foundation or the PEI Archives can be a valuable resource for historic architectural images. Also, the Architects Association of PEI can provide a list of qualified design professionals with the knowledge and creativity to guide a building owner through the many options and determine the best window solution for a particular building.



The Approval Process



Charlottetown's tradition of careful planning and protection of its architectural legacy has contributed to its reputation as a city which greatly values its surviving historic structures and recognizes the impact they have on the character and quality of the City. It's original plan remains strongly present and is reinforced by the many historic buildings which remain active, effective and vibrant today.

In an effort to preserve, enhance and revitalize the defining historic character of Charlottetown and, in particular, the original 500 lots south of Euston Street, the City applies historic designations of varying degrees to its buildings and lots. These designations are intended to identify the relative significance and historic value of a particular building or area. The City's mandate is to guide the use and development of structures in historically sensitive areas so that the essential character and qualities of historic buildings are protected and that new construction is designed to be compatible with the use, size and character of the surrounding area.

When considering work which impacts the windows, a building owner should first consult with the City's Heritage Officer. The Officer can guide the owner in the decision-making process, assist in filing an Application for Building Permit and, in many cases, has authority to approve the work. When the proposed work is more involved or historically sensitive, it must be considered by



the City's Heritage Board. The Board is a panel made up of volunteers with specific knowledge and experience in historic architecture and urban issues. The Board meets approximately once each month to review submissions and make recommendations to the City Planning Department. Submissions must be received at least 1 week prior to a scheduled meeting. The Heritage Board's Mission Statement is as follows:

"The City of Charlottetown is committed to the preservation and continued use of the Historical resources that contribute to the physical, social, educational and economic development of the municipality. The components of our heritage that help define our community's unique character include sites, monuments, structures and buildings, streetscapes, squares, and environments of historical, architectural, social and cultural significance."

The recommendation of the Heritage Officer or Heritage Board will then be considered by the Planning Department along with issues of Building Code and City ByLaw compliance. The Owner will be notified if the work has been approved or denied and a Building Permit will be issued following the payment of the Permit fee. It is important that no work be undertaken prior to receipt of the Building Permit. The City can stop unauthorized work, require work to be undone and/or issue fines.

Evaluating the Situation



The first consideration in assessing a building's windows should be their historic or aesthetic value. The existing windows in any building should be considered significant if any of the following conditions exist:

- the windows are original
- the windows reflect the original design intent for the building.
- they reflect the time period, regional styles or building techniques.
- they reflect some change to the building resulting from a significant event.
- they are examples of exceptional craftsmanship or design.

If any of the above factors are found to be the case, then serious consideration should be given to repairing or restoring the windows rather than replacing them.

The next step when addressing problem windows is to assess the condition of the windows and surrounding walls. Failure to take an honest and careful look at the existing windows makes it impossible to determine the most appropriate course of action. Consider the window's air tightness, assess the condition of its finish and look for water damage. Windows with cracked glass, peeling paint or loose fit may look bad but are not necessarily beyond repair. Most property owners can perform an assessment themselves but many may prefer to have an independent contractor or other professional evaluate the condition of the windows and surrounding exterior walls.



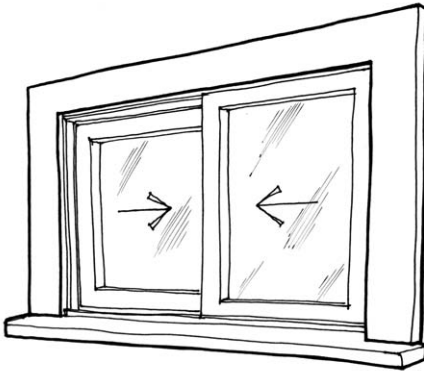
Since it can take time to thoroughly examine existing windows and replacing windows is often easier to price, some contractors may automatically over-price repair work to make replacement windows appear to be a more economical choice. Owners should be cautious of this and, if necessary, seek a second opinion from either another contractor or professional.

Owners should be familiar with the components which make up a window and understand how their windows work. This will allow them to assess the window in an informed manner and to understand and evaluate the advice given by others. This guide offers a brief description of the parts of a typical vertically sliding window but much more information is available on the internet and other resource material. Owners should feel comfortable to ask as many questions as necessary to really understand the information and advice being offered by contractors, architects, sales people and authorities.

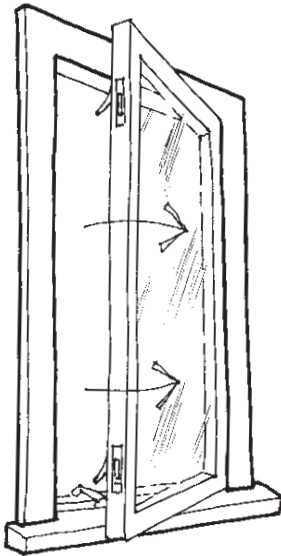
The following are just a few of the questions which should be answered by a thorough appraisal but each situation will have its own unique factors to consider:

- Are the existing windows original to the building or were they replaced at some point during a previous renovation?
- Are the existing windows appropriate to the style and character of the building?
- How visible are the windows to be worked on? Are they on a street elevation with high visibility or do they face a back yard or side alley?
- Is there indication of water damage or rot on the window and/or surrounding walls and, if so, how extensive is the damage?
- Is the window set properly into the wall or are there gaps at the edges?
- Is the window finish intact or is the paint peeling off?
- Is the glass edge seal in good condition or is it cracked and loose?
- Is the hardware original, is it in good condition and is it functioning well?

Typical Window Types



Sliding Window



Casement Window

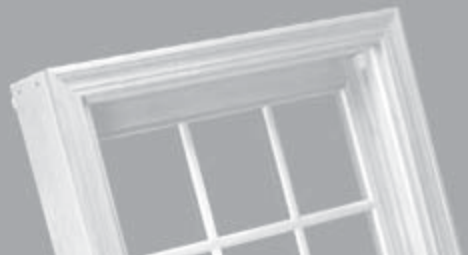
Most historic or contemporary windows can be divided into three main categories based on their function: sliding, swinging or fixed.

Sliding windows may move horizontally or vertically. They may be single hung (or single gliding) with only one sash being operable or they may be double hung (or double gliding) where both sashes can open.

Swinging windows may be *casement* where the hinges are on the side like a door. They may be *awning* with hinges on the top and open either inward or outward. Finally, they may be *hopper* with hinges at the bottom and open inward or outward.

Fixed windows are simply windows which are not designed to open. While a sash is not required for a fixed window, it can be constructed with a non-functioning sash so that the window has the same appearance as an operable window. Fixed windows are typically used in areas where ventilation and exiting are not factors, areas requiring greater security or areas with limited or difficult inside access.

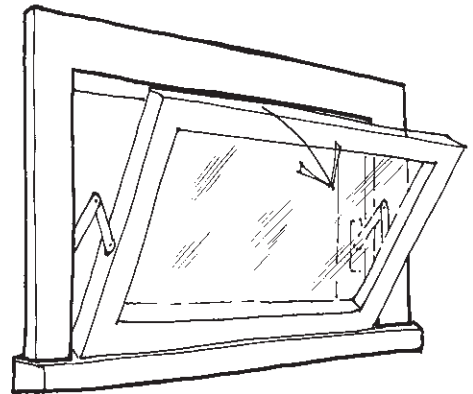
There are also many specialty windows in an endless variety of shapes such as circles, half-circles, octagons, triangles or ellipses. Most often, these more distinct windows will be fixed but many can be fully or partly operable.



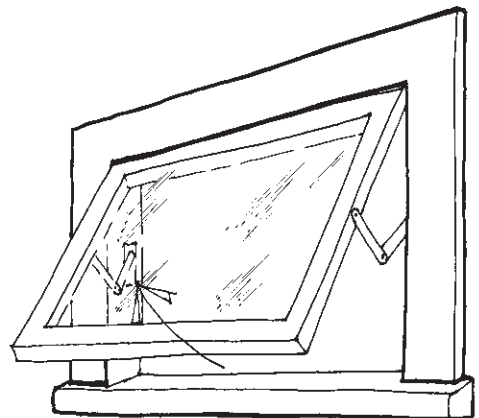
Roof windows, or skylights, are designed to be installed into a horizontal or sloping surface. They may be fixed or they may be operable by remote-controlled motor or extension crank handle.

Storefront or commercial display windows usually consist of large glass panes which fill much of the width of the front or street-facing wall of a commercial building's ground floor. They often incorporate an entrance which may be located in the centre or to one side. Until the 1940's, storefront windows were usually all wood construction. Gradually, wood sashes in metal channel corners became the norm and, today, all metal, extruded aluminum windows are most common.

Within a single window, there may be various combinations of these types, functions and shapes. The way in which these window types are combined is often a distinctive characteristic of the building's style.

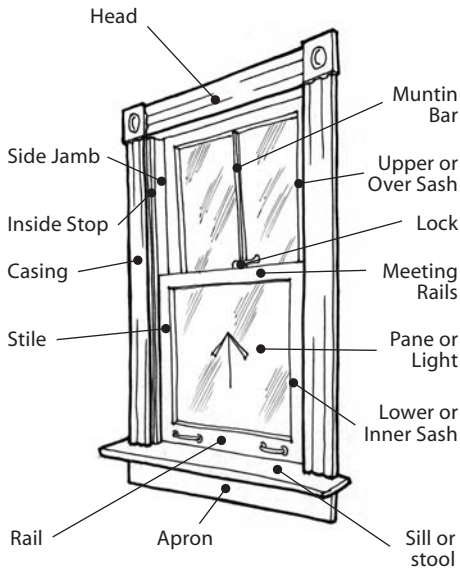


Hopper Window



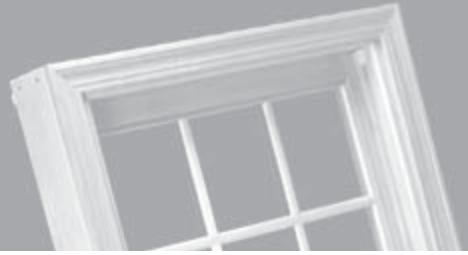
Awning Window

Window Components



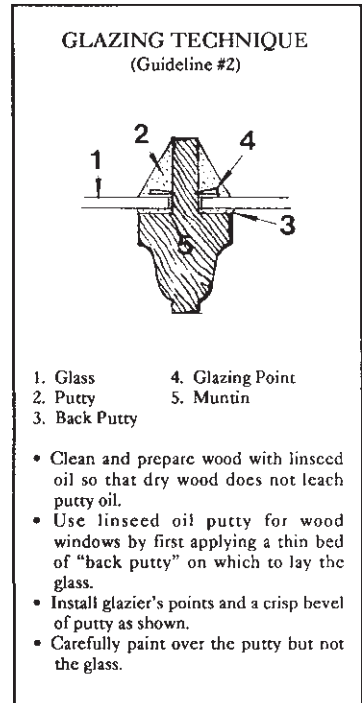
The components of a window will vary slightly depending on its type but there are some basic parts common to most. It will help to be familiar with these parts when looking at or discussing your windows. The diagram to the left identifies the components which make up a typical single hung window:

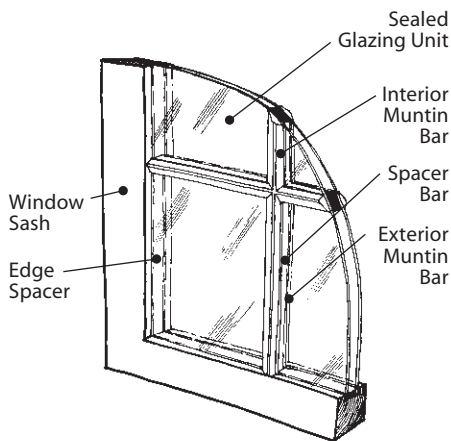
Although increasingly rare, some historic windows still have original hand-blown glass with ripples, bubbles or other unique patterns which give windows a hand crafted “jewel-like” quality not seen in glass manufactured today. Until the 1800's, molten glass was spun on a rod to spread it as it flattened. This process made smaller panes relatively easy to produce while larger panes were considerably more difficult and expensive. Historic windows tend to be ‘true divide’ (also known as cutlite) meaning that the glazing consists of individual smaller panes separated by wood muntin bars. In the 1800's, techniques were developed to wrap semi-molten glass around a cylinder, cut and laid flat before it hardened. This allowed larger panes of glass to be mass produced at lower cost. The availability of larger, less expensive panes is reflected in the style of windows from this period where there tend to be fewer muntins dividing the sash. Original glass is highly valued and its character is another benefit to repairing or restoring original windows.



The development of 'float glass' in the mid 1900's (where very large sheets of glass are formed by pouring molten glass over a bed of molten tin and allowing it to harden) changed the economics of windows making smaller panes more expensive than larger ones. Newer windows may still be true divide but, more likely, they will be 'simulated divide' where a larger pane of glass has false muntins forming a grill which is applied to the face of the glass to give it the appearance of an older window. Whether true or simulated, the way in which the glass of a window is divided is determined by the style and type of window and this, in turn, is determined by the architectural style of the building. A window with more panes of glass per sash is not necessarily more historically appropriate for a particular building. A window's glass pattern will typically be described as the number of divides in the upper sash of a window 'over' the number of divides in the lower sash. For instance, a window described as 6 over 6 will have a grid of 6 equal panes of glass in the upper panel and 6 panes in the lower panel. Similarly, a 2 over 1 window will have glazing in the upper sash which is divided in half over a single pane of glass in the lower sash.

In historic windows, the glass is held in place by glazing points, small metal clips driven into the wood muntin at intervals around the edges of the glass. Putty is then applied to the edges of the glass to form an air and moisture seal against the muntin. Over time, the putty often dries out and cracks, breaking this seal.





Simulated 'True Divide'

When this occurs, the old putty can simply be removed, the edge cleaned, any missing or damaged points replaced and new putty or more flexible caulking applied. The same procedure is followed to replace any cracked or broken panes of glass.

Besides simple plate, the glazing itself may be tempered (safety glass designed to shatter into small nuggets), laminated (manufactured with layers of plastic sandwiched between the glass to prevent it from separating into shards when broken) or it may be layered with films or coatings designed to reduce glare (solar grey) or heat transmission (LO-E)

Newer manufactured windows usually consist of 'sealed units' of 2 or more layers of glazing sealed at the edges to create insulating air spaces. Sometimes, the resulting air spaces are filled with a type of gas which further reduces heat transmission. The layers of glass in a multi-glazed window are held apart by edge spacers. These may be made of a material which conducts heat and cold such as aluminum or they may use less-conductive materials such as thin stainless steel, plastic, foam or rubber. These warmer edge spacers will help to keep the inside layer of glass from becoming cold in the winter.

If a window has no air space or if the edge spacer conducts the cold to the inside, condensation or frost will form on the glass (usually near the edges where the glass is coldest). This phenomenon is caused by warmer, moist inside air cooling as it meets the cold glass to the point where liquid water condenses out of the air and forms on the glass.

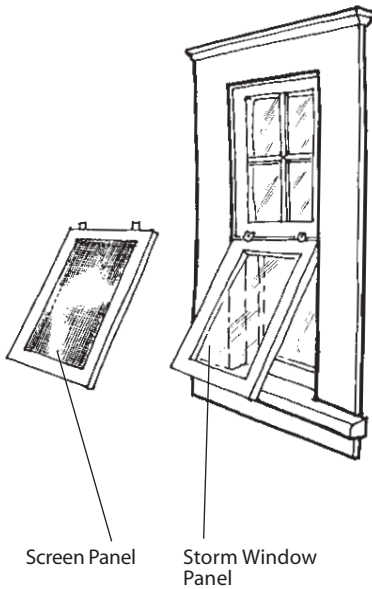


Depending on the thickness of the sash and muntin bars, it may be possible to retrofit an existing sash to receive a second pane of glass making it into a double glazed window or to replace the single pane with an sealed insulated glass unit. This is only an option if the sash is strong enough to handle the additional weight and thick enough to be routed for the second pane or the sealed unit. Additionally, if the windows are counter-weighted, it may be necessary to increase this weight and the pocket may not be large enough.

Larger historic double and single hung windows are usually counterbalanced by a system of weights and pulleys or springs concealed in pockets in the side jambs. These make the window easier to operate by taking much of the weight of the window sash. Springs are typically found in windows dating from the 1940s and 1950s, while weights are more common in older windows. Over time, these mechanisms often become less effective as dirt and old lubricants build up on the pulleys and cords. It is quite easy to remove the side window trims to assess the condition of the counterbalance mechanism.

If the components seem to be in otherwise good condition, a good cleaning and lubricating will often return the window to good working order. Replacement hardware is available for these windows if the cords have frayed or broken or the pulley mechanism has failed, and these mechanisms are often easy to repair.

Window locks have not changed significantly over the years. With most single or double hung windows, the lock will consist of a steel lever on the top of the lower sash which rotates to lock into a flange secured to the bottom of the upper sash preventing the sash(s) from sliding. Casement windows will have a similar mechanism at the side edge of the window sash. If the lock has become loose or otherwise failed, it can easily be replaced.



Storm Windows:

With newer windows, multiple layers of glass typically form a sealed unit within the sash. The purpose of double or triple glazing is to reduce the transmission of heat and noise by creating an airspace between the inside and out. Traditionally, this benefit has been achieved with older single glazed windows by installing storm windows. Generally, storm windows are single glazed with an aluminum or wood frame. They are usually applied to the exterior face of an existing window to prevent drafts and improve the energy efficiency of the window by trapping a layer of 'stable' air against it. Some storm window frames are bulkier than others. The least conspicuous storm windows will have a light, single track frame. Often, the storm window will be divided into 2 or more panels which can be replaced with screens when required. With single track frames, the screens are stored elsewhere when not in use. With multiple track frames, the screens stay in the window but the frame is necessarily thicker and bulkier in appearance.

If the wood framing is substantial enough, it may be possible to modify an existing storm window to cut it into sections which can be locked together using special hinge clips. This offers the ability to permanently secure much of the storm window to the window framing and seasonally change only the section which aligns with the operable sash of the window unit. The removable storm window section can be easily replaced with a screen from inside the building. This can greatly reduce the labour required to install and remove storm windows, especially on upper floors.



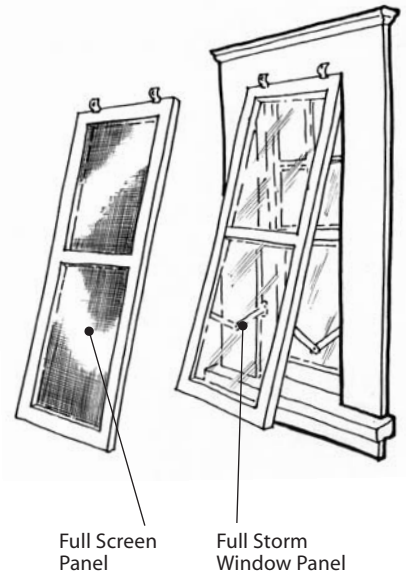
Older storm windows would usually be constructed to match the pattern and location of the divided lites, effectively mimicking the primary window. Later storm windows, however, tend to be single lite which obscures the primary window's lite pattern and other details when light reflects off the larger glass pane.

Storm windows generally look best when they replicate the light pattern of the primary window, are finished in the same colour as the primary window and trim, have any screens mounted on the inside of the storm window and have the slimmest profiled frame.

When restoring a property, it may be preferable not to see storm windows at all on the exterior so some manufacturers also offer storm windows which mount to the inside of existing windows. Interior storms are usually mounted to the jambs and may be hinged or on tracks to facilitate cleaning. During colder temperatures, condensation can sometimes form on interior storm windows but this can be minimized with proper installation, weatherstripping, weep holes and caulking.

Similarly, it may be possible to 'piggyback' aluminum-framed glazing onto the inside of the existing sash. With both of these options, it is critical to get a tight seal at the sash.

When it comes to energy savings, the installation of a good quality storm window to a restored or repaired original window can offer a much better return on investment than replacing the window.



Repairing Windows

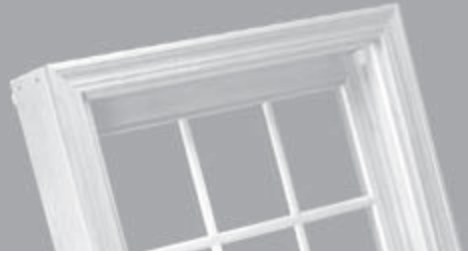
Sometimes historical designation will dictate that existing windows be retained and repaired or an assessment will demonstrate without question that retaining the existing windows is the best option. If this is the case, then it becomes a matter of selecting a contractor and deciding on the best option for repairing or upgrading.

The wood found in most windows older than the 1950's will be a dense first-growth or 'heart' wood (often pine) which is very strong, stable and resistant to rot and disease making it superior to most other woods available today. When well maintained and repaired, these windows can have a life span of up to 200 years.

Even windows which appear to be in poor condition may be structurally sound and require little effort to repair. So, unless a building has suffered significant water damage, the window frames are usually quite sound. Any rot will often appear only at the bottom end of the jambs or the sill where water can collect and saturate the wood but such damage can be easily removed and repaired. If there is significant damage to a window, it will usually involve the lower sash which is used and abused the most. Here too, damage can be repaired either on the spot or, if it is more extensive, in a shop.

If a window shows signs of rot then it is critical first to identify the cause of the water damage. This may be the result of damaged or flawed detailing on the roof or wall cladding above or around the window, overgrown trees or shrubs trapping moisture against the window, or there may be problems with the flashing at the top of the window or the sill may not be properly sloped and sealed.

Once the cause of the problem has been identified and corrected, then the window can be repaired. Rotted wood can be removed and new treated wood spliced in or epoxy fillers used to seal and recondition these areas.



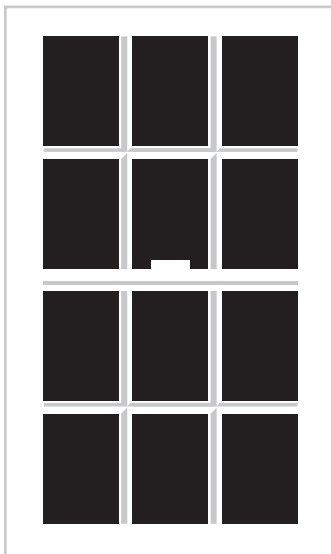
If a window is merely cloudy, drafty or hard to operate and the window shows no signs of water damage, then there are more options. The simplest and most minimal approach is to leave the interior and exterior trims and window frame and replace the damaged portions or, if necessary, the whole sash. Repairing or replacing all or part of the sash can be relatively easy and fast to do, does not disturb the surrounding wall or trims and is the least expensive way to upgrade your window.

A window's paint finish serves more than aesthetic purposes. A well prepared surface and properly applied paint finish will protect the wood and joints from water and UV damage. An evaluation of a window will reveal the degree of re-finishing required but, generally, existing paint should be stripped down to either bare wood or a well-bonded previous coat of paint. Any patches of exposed wood which has been cracked or damaged from exposure to UV light should be well sanded. All bare wood and joints should then receive coatings of a water-repellant primer/sealer before repainting. The more care taken to prepare for and execute the painting, the longer the period will be before the windows will need to be painted again.

The main reason that older windows have a reputation of being poor energy performers is that, without proper maintenance, they can allow too much air infiltration. Even with single glazing and colder climates, older windows can achieve good efficiency if some simple maintenance is performed: cracked glazing should be replaced, good weatherstripping installed, putty replaced, frames caulked and sashes tightened.

Retaining original historic windows does require maintenance. However, a benefit exists in having windows which are maintainable as opposed to disposable. Sustainability of construction materials is becoming increasingly important and many new window systems are designed to be replaced when they fail rather than to be repaired. This fact can dramatically impact the true cost of a window over the life-span of a building. In the context of life cycle cost analysis, a program of window repair and upgrade is often less expensive than total replacement. Depending on the extent of repairs required, availability of qualified craftsmen and other factors, it is generally costs less to repair existing windows than to replace them with new ones. Since new windows represent a significant portion of a renovation budget, this saving in capital cost can be substantial.

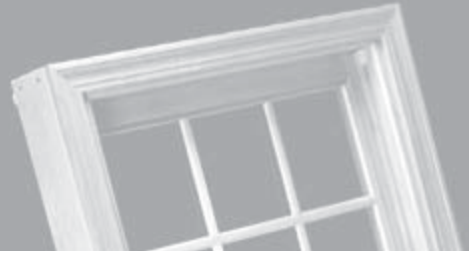
Partial Replacements - Inserts



Partial Replacement - Inserts

If the condition of the window is such that repairing or replacing only the sash is determined to not be a viable option and replacing the whole window is thought to be too disruptive or costly, then it may be reasonable to consider a third option, installing an insert consisting of a frame and sash into the existing window framing. The insert is set into the existing jambs and sealed tight with expanding foam. Since the sash and frame are built and tested as a complete unit, this option may provide a more dependable energy rating than replacing the sash alone. It is usually less invasive than replacing the whole window and will not disturb the trims and surrounding wall. However, since one is thus adding a second window frame, the glazed area of the window will be reduced by up to 3/4" on each side and the window will present a bulkier appearance which could dramatically alter the character of the building.

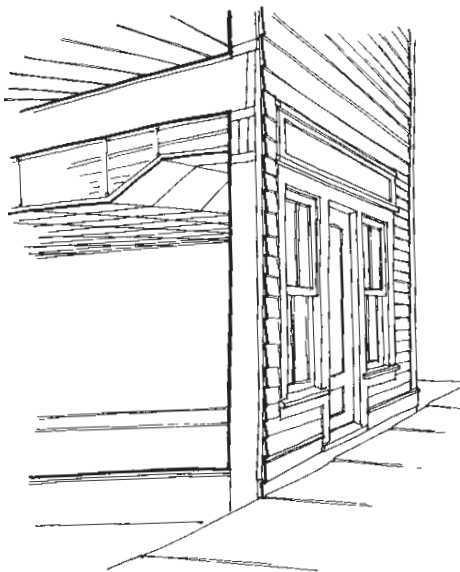
Replacing Windows



Window replacement should be justified only when the original windows have been previously replaced with units that detract from the heritage character of the building or when the windows are so deteriorated that, even if repaired, very little original material would remain. If an assessment of the existing conditions warrants window replacement and all approvals have been obtained, then the existing window, trims and some of the surrounding siding are removed. The new window is then installed with new flashing, expanding foam air seal and quality caulking at the top and sides. Replacing a window can be an invasive, difficult and expensive process but, if done properly and sympathetically, it can provide a durable, energy-efficient window assembly which is appropriate to the original character of the building.

Over the long term, many replacement windows cannot be repaired and therefore become disposable. As sustainability becomes increasingly important, it is a definite long-term benefit to have the ability to repair and maintain individual components rather than replacing the entire window unit.

When replacement windows are justified, every effort should be made to replicate the originals so that unique features such as materials, moulding profiles, muntin bar sizes and the joinery can be matched. Most suppliers manufacture lines of windows which approximate the style and character of most historic window types. Traditionally, it was common to use less expensive



Drop Ceiling Set Back

windows, cladding, trims, etc. on the less visible sides of a building and spend the money on elements where they will be seen by the most passers by. It may be justifiable on less significant facades such as the rear or alley-facing, to install more standard mass-produced units.

It is not uncommon to see cases where original windows have been replaced with little regard for the size and shape of the original window opening. This is often seen in masonry buildings with arch or round-top windows or in commercial buildings with tall storefront windows. Replacement windows should always fit the building's original openings. The arched or rounded upper sections of an opening should not be filled in to allow the installation of a simple rectangular window and storefront openings should not be filled in to reduce the window area.

Often, suspended ceilings have been installed in many buildings at a height lower than the top of the original window opening. In such cases, the ceilings should be stepped up to the original height adjacent to the windows so that the full height of the original window opening is exposed.

Windows in Charlottetown which are more than 50 years old will typically be of solid wood construction but replacement windows are now fabricated using a variety of materials, each with both positive and negative characteristics.

**Natural or Engineered Wood** (without cladding):

Solid wood windows are generally the best suited for replacing windows of a historic nature. Materially and aesthetically, they offer the greatest ability to blend with and contribute to the historic character of a building. When well maintained, wood windows have good insulating value, a pleasing appearance, and they can be painted. On the other hand, wood which is not maintained may rot, shrink and swell. Wood windows may be factory primed and painted after installation or they may have a high-performance paint finish applied under controlled conditions in the factory. The types of finishes and colour range will vary between manufacturers and, while these finishes will have a very long life span, they will eventually require re-painting.

Solid Vinyl or Vinyl Clad (reinforced vinyl):

A window's sash and frame may be solid vinyl extrusion or they may be wood which is clad on the exterior in vinyl. Windows with sashes and frames of solid vinyl extrusion are the least expensive. Vinyl and vinyl clad windows tend to be easier to maintain and may be a good option in coastal areas where metal claddings may corrode over time. They are typically available in a very limited colour range but can be painted. Vinyl will contract and expand more than wood as the temperature changes. While the window is constructed to account for this alteration, light coloured vinyl with heat-welded corners will minimize potential problems.

Fibreglass:

Fibreglass windows are stronger than vinyl and can be extruded into thinner profiles. They can be manufactured with wood interiors and can be painted. They are more expensive than vinyl but, unlike vinyl, the frame and the glass expands and contracts by the same amount as the temperature changes.

Aluminum Clad:

Aluminum-clad windows are very durable and the aluminum is available in a wide range of colours (some suppliers are able to match a custom colour). They are the most expensive option and the aluminum may corrode over time in coastal conditions.

Aluminum:

Aluminum windows are durable, dimensionally stable and require little maintenance but are expensive and very poor thermal insulators. Aluminum is available in a wide range of coloured coatings and finishes.

Steel:

Steel-framed windows are not commonly used today but are manufactured and offer a good system. Historically, they were commonly used in older commercial or industrial buildings and original steel windows will tend to exhibit problems with rusting. Steel conducts heat less than aluminum and, since steel is stronger than aluminum, thinner profiles can be used. High performance primers and coatings are available to protect the steel and greatly reduce maintenance costs.

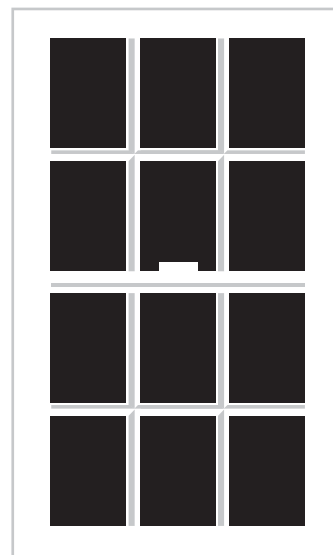
As with any industry, window manufacturers are constantly developing new products. Wood resin composites, PVC foam and insulated vinyl are just a few of the materials now being offered. While new window materials and systems may well offer promise, care should be taken to ensure that any new window has undergone rigorous independent testing and is well warrantied. Most of the larger, more established window manufacturers will offer a 20 year warranty on the window seal and a 10 year warranty on everything else (frame, sash, hardware, etc.). It is important to bear in mind that a window's warranty is only as good as the manufacturer which offers it. Consider the length of time that a manufacturer has been in business and the quality of its reputation.

Energy Performance Rating Labels



Windows are thermal holes in a building's exterior. Considering that an average building may lose 30% of its heat energy through its windows, the more energy-efficient the windows are, the less heat that will be lost. Knowing how to read the Energy- Performance Rating label on a window will help one to choose the best window for any situation.

The capacity of the window to insulate and prevent heat from escaping is represented by its U-factor number. The U-factor on the label will represent the sum total of the U-factors for the glass, frame and sash. The lower this number (0.35 or less), the better insulating the window will be. In colder climates, this factor tends to be the most important consideration.



In warmer climates or where there is a large concentration of windows, the amount of solar heat allowed in by a window becomes more of a factor. This percentage of the sun's radiant heat allowed in by the window is represented by the Solar Heat Gain Coefficient (SHGC). A value of 0.5 to 0.7 is fine for cooler climates but a lower number will mean less solar gain.

A window's label will identify whether the glazing is single, double or triple. Double glazing is standard but triple glazing is of benefit in colder climates. Impact-resistant glazing is available and may be advisable in coastal areas subject to storm winds.

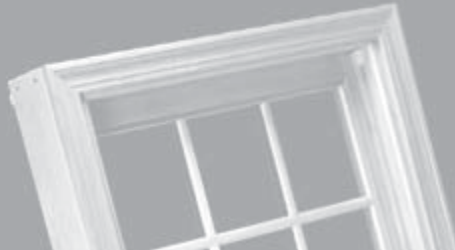
Moreover, the space between layers of glass may be filled with argon gas which resists the transmission of heat better than air. If there is an argon fill, this will be identified on the label. The optimal space between layers of glass is 1/2".

Low-emittance (low-e) coatings are transparent metal films applied to the surface of the glass to bounce heat back into the building and reflect the sun's longer wave heat energy in the summer while allowing the shorter wave visible light to pass through. If the glass is coated, the label will indicate "low-e".

The label may also provide additional information and performance ratings including: air leakage, water leakage, condensation resistance and impact performance.



Where to Find Help



Most cities - including Charlottetown - have guidelines and processes in place governing any work to buildings which are historically designated or located within a historic district. These guidelines include the replacement or repair of windows. Before undertaking any work to change, repair or restore existing windows, it is important to consult the City's Heritage Advisor or one of the City's planning officers or a design professional. They can save a building owner much time and money by advising on application procedures, reviewing submissions, defining limitations and restrictions and providing recommendations, references and resources.

The history, design and science of windows can seem a daunting subject but a bit of reading will provide the knowledge necessary to make good decisions. The following are just a few of the many valuable resources available both in print and digital format:

“Design Guidelines for the Preservation of Historic Structures In Charlottetown” by Tom Ward is a guide produced for the City of Charlottetown in 1992. It is very useful in identifying a building's style and type of windows appropriate to that style.

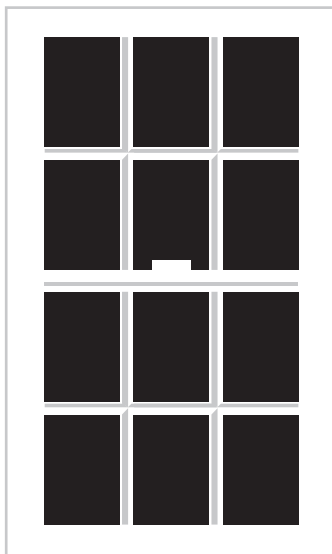
“Repairing Old and Historic Windows” produced by the New York Landmarks Conservancy in 1992 is an excellent guide to the repair of historic windows.

“Standards and Guidelines for the Conservation of Historic Places in Canada” produced by Parks Canada to provide sound, practical guidance to good conservation practice in general.

“Window Rehabilitation Guide for Historic Buildings” produced by the Historic Preservation Education Foundation in Washington, DC in 1997. This compilation offers considerable information on historic window repair, maintenance, thermal upgrade and performance standards.

“The Window Handbook” produced by the Centre for Architectural Conservation at Georgia Institute of Technology for the US Department of the Interior in 1991. It provides extensive information on the evaluation, repair, weatherization, glazing and sash replacement and accessories for historic windows.

Conclusion



Retaining or replicating the original windows is one of the best ways to retain the charm and character of an older building. Windows represent a significant percentage of a most facades and their impact on the aesthetics of a building can not be over estimated. Inappropriate windows can dramatically diminish a building's character while the right windows will strengthen and elevate it to a higher level.

When a historic building is completely demolished, it has an immediate and clear impact on the surrounding area. However, smaller alterations can be made to a building over time which are less noticeable but no less damaging. Siding or roofing is changed, original trims and details are removed or doors and windows are altered. However well-intentioned, such changes result in the gradual weakening of the architectural character of historic buildings.

The City of Charlottetown hopes to encourage building owners to learn more about the potential benefits of restoring historic properties. The repair and maintenance of original wood windows or the replication of historically appropriate windows will greatly enhance individual buildings and the community as a whole.



City of Charlottetown

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