WINDOW REPLACEMENT

Property owners and developers undertaking rehabilitation projects for both Tax Act Certification and Section 106 Compliance are encouraged to repair and retain existing historic windows. However, in some cases, the windows may have deteriorated and may need to be replaced. In order to show a need for total window replacement, the condition of the existing windows must be documented and their replacements must conform to the Secretary of Interior's *Standards for Rehabilitation.*

Survey

Before windows can be replaced in a rehabilitation project, the existing condition of each window should be documented. This should be undertaken in the form of a window survey. The survey is intended to identify the extent of deterioration in each window and to provide a decision base as to whether the windows should be repaired or replaced. It is recommended that the survey be conducted and completed by someone who is knowledgeable in the field of architectural conservation or building conservation.

In order to complete a window survey the following information is needed:

- Drawings
- Clear, color, detailed, photographs or representative windows (all major window types, all elevations, and windows in varying conditions of deterioration), numbered to coincide with the elevation drawings. Including the following:
    1. full frame photographs of individual windows of the exterior.
    2. close-up views of intersections of sills and frames (exterior)
    3. close up views of sash focusing on bottom rail and muntins (if existing)
    4. full frame photographs of individual windows from the interior
    5. close-up views of sills and bottom rails from the interior.
- A completed survey form. (see enclosed)

The survey form documents the existing condition of the windows and identifies which windows will be repaired, which windows will possibly be replaced, and what the proposed new window treatment will be. The form indicates what the number on the drawing is and its corresponding photograph number. The existing type denotes the material of the window/door and the type of window/door that it is. For example, WD DH would be wooden, double hung and MTL CASE would indicate that the window would b a metal casement. The configuration would be the number of lights in the sash. Possible examples could include, twelve over twelve (12/12), six over six (6/6, or one over one (1/1). There is also space for additional remarks when necessary.

A four level classification system is used to document the existing condition of each of the windows. This classification is based upon the system identified in the National Park Service publication, Preservation Brief #9, "The Repair of Historic Wooden Windows." Class One, "Routine Maintenance," is associated with small repairs, which are usually performed as a part of a building's annual maintenance program. This may include paint removal, reglazing, weather-stripping, caulking, and repainting. Class Two, "Stabilization," shows a small degree of physical deterioration but can be repaired in place by patching, waterproofing, consolidating, and regluing the existing material. Class Three, "Partial Replacement," has localized deterioration in specific areas. These members are totally removed and new ones are spliced into the existing fabric. In Class Four, "Total Replacement," if the entire fabric of the window has deteriorated, then the only feasible alternative is total replacement.

On the survey form under "Existing Conditions," each sill, frame and sash is rated as to whether it is Class I, II, III, or IV. After all the windows have been rated, they are totaled by class for each of the window elements: sill, frame, and sash are compared. Those windows in Class I, II, and III, should be repaired and those in Class IV should be repaired with exact duplicates. If the number of Class IV windows exceeds 75%, then total replacement may be approved.

Replacement

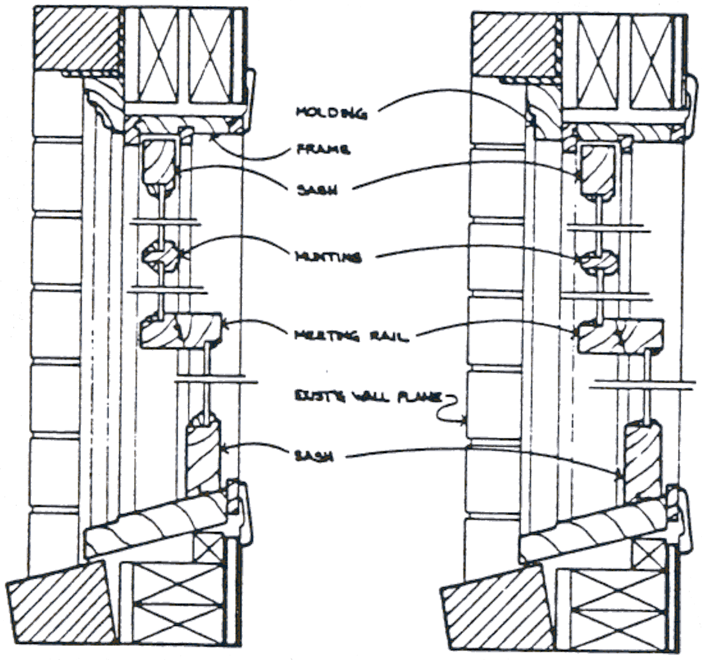
The selection of replacement windows should not begin with what is commercially available, but rather with what is being replaced. A major concern with most replacement windows is that they do not accurately replicate the historic appearance of the existing windows. Replacement sash should match the historic sash in pane size and configuration, glazing, muntin detailing and profile and historic color and trim. Frequently, the profiles of replacement elements, such as muntins, sash, frames, and moldings, are flatter and wider or narrower and thinner than the historic profiles. A stock window may duplicate the exact number of original panes, but a change in relief affects the character of the historic window, which in turn alters the overall appearance of the entire building.

Therefore, window sections will be required for all projects involving total window replacement. In order to compare the original and new profiles, the following information is needed:

- Full horizontal and vertical sections of the existing windows (3"=1'0")
- Full horizontal and vertical sections of the proposed replacement windows (3'=1'0"). If historic windows do not exist in the building and no evidence of the historic appearance can be located, then only proposed sections are required.

Window sections must be carefully detailed so that all parts of the window are shown and materials are specified. A section must show the profiles of muntins, meeting rails, sash, frames, and moldings. It should also show the window's relationship to the existing wall. Below are examples of vertical window sections of both a historic and a replacement window. The new window's profile closely resembles that of the existing window and therefore meets the Secretary of Interior's *Standards for Rehabilitation.*

Example:



Historic Window
Vertical Section

Figure 1

Replacement Window
Verticle Section

Figure 2

To summarize, owners are encouraged to repair the existing windows rather than replace them. If they existing condition of the window, as documented by a window survey, indicates that the window has deteriorated, then the windows may be replaced. All replacement windows will match the originals as closely as possible and must conform to the Secretary of Interior's *Standard for Rehabilitation*.

Replacements where there are no historic windows

Historic windows make a significant contribution to the character of most historic buildings, but many rehabilitation projects begin with a building that has no historic windows. Whether new windows will replace ones that have been previously replaced or will fill openings where windows are entirely missing, the new windows must be consistent with the historic character of the building. The existence of inappropriate replacement windows does not justify further replacements that are not compatible with the building.

The ideal basis for the design of a replacement window is the original historic window. Information on the appearance of the historic window can come from physical evidence that survives in the building or from historic photographs. Evidence of missing historic windows can be misinterpreted, however, and can lead to an inappropriate choice of replacement windows. Especially when working from information on a limited portion of the building, it is important to understand that all windows in a building may historically not have been the same.

Just as the quality and refinement of masonry may differ between the façade and the rear or side elevation, reflecting a hierarchy in the design of the building, the details of the windows may also vary, similarly reflecting issues of cost and appearance. It is obvious that refined face brick with tooled, tinted mortar is more costly masonry than common brick with coarse joints of plain mortar. It may be less obvious that until the 1920’s a large-paned, 1/1 window was more costly than a 2/2 or 6/6 window. Prior to the mechanization of glass manufacturing, the added cost of a large piece of glass exceeded the cost of the wooden muntin structure that supported multiple smaller pieces of glass. Thus, a large, mid-19th century house might have 2/2 windows on major elevations yet have 6/6 windows on a rear wing; or a turn-of-the-century office block might have 1/1 plate glass windows on street facades, but 2/2 windows on an alley elevation. Glass size is not the only aspect of windows that may differ from one part of the building to another. In urban areas where the spread of fire was a concern, windows in close proximity to other buildings such as those that faced a narrow alley were often metal, instead of wood as would be typical on the primary façade.

Though a single surviving historic window can provide the basis for replacement windows that can significantly improve the overall historic character of a building, such evidence must be evaluated in the context of the design of the building itself. The more that is understood about the factors affecting the choice of windows, the more likely limited historical evidence can be correctly interpreted.