

## **WINDOW REPLACEMENT**

Property owners and developers undertaking rehabilitation projects for Tax Act certification 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.

### **Replacement**

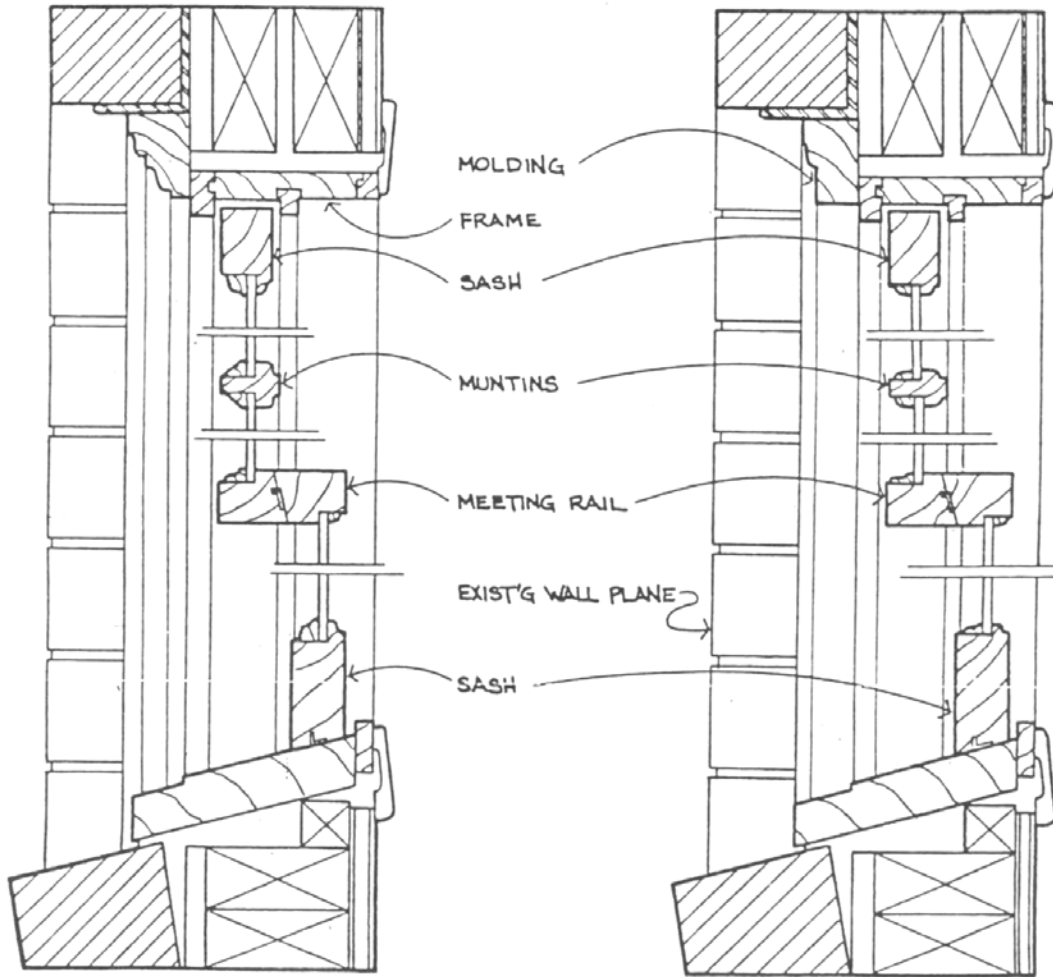
The selection of replacement windows should not begin with what is commercially available, but rather with what is being replaced. A major concern with most replacement windows is that they do not accurately replicate the historic appearance of the existing windows. Replacement sash should match the 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 are required for all projects involving total window replacement. In order to compare the original and new profiles, the following information is needed:

- Clear exterior photographs of the existing windows including close ups.
- Same scale full horizontal and vertical sections of the existing windows.
- Same scale full horizontal and vertical sections of the proposed replacement windows.
- 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. Ideally, 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. This documentation clearly shows the new window's profile closely resembles that of the existing window and therefore would be approved by NPS.



**Figure 1**  
**Historic Window**

**Figure 2**  
**Replacement Window**

### **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 (don't assume wood 1/1s are appropriate for all projects). It is also important to note that 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-19<sup>th</sup> 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 downtown commercial block might have 1/1 plate glass windows on street facades, but 2/2 windows on an alley elevation.

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.