

Restoration of Historic Windows: Methodology and Case Studies

Edward A. Gerns¹ and Sarah K. Van Domelen²

¹ Wiss, Janney, Elstner Associates, Inc., 10 South LaSalle, Suite 2600, Chicago, Illinois, USA,
egerns@wje.com

² Wiss, Janney, Elstner Associates, Inc., 10 South LaSalle, Suite 2600, Chicago, Illinois, USA,
svandomelen@wje.com

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1 Introduction

All too often, original windows are unnecessarily removed and replaced from historic buildings. In some instances, replacement is justified due to the extent of deterioration resulting from years of deferred or inappropriate maintenance. However, often historic windows are unnecessarily replaced as a result of incorrect assumptions or misinterpretation of their condition. Alternatively, a designer may believe that a new window will perform better, require less maintenance, increase energy efficiency, or just last longer than the existing original windows.

This paper will address issues related to the evaluation and restoration of historic wood and metal windows. An overview of the methodology used by the authors to evaluate the condition of windows and determine repairs that are necessary to maintain structural integrity, repairs that are necessary to address air and water infiltration, and repairs relative to aesthetics and function, will be presented.

2 Evaluation Methodology

Determining the general condition of any historic window is critical to developing a restoration program. The methodology used by the authors when evaluating historic windows includes document review, comprehensive or representative close-up interior and exterior surveys, investigative openings, and partial or complete window disassembly. Based on the available funds and access, all of these tasks may not be possible or practical. Much like any aspect of building restoration, building owners should understand that gathering more information during the initial evaluation can reduce the potential for unanticipated added costs once work begins.

When existing building drawings or specifications exist, review of these documents can provide insight into the construction of the windows, as well as the method of anchorage to surrounding construction. Review of documents detailing past maintenance or repairs can also help identify existing conditions.

Close-up observation of the interior and exterior portions of the windows is critical to determine the extent of intervention that may be required. While a comprehensive review of all windows is ideal, selected review must often suffice due to access considerations. If possible, windows from all facades and different floors should be reviewed. If there are different types of windows, a sample of each should be included.

If the water resistance of the windows is in question, performing water testing using various

techniques can provide an indication of the source(s) of the leakage. It is important to understand, however, that historic windows cannot meet standardized testing criteria for new windows, and that failure to meet current standards for water resistance is not a basis or justification, in and of itself, to replace the windows.

Investigative openings can be helpful in determining window anchorage details, as well as the configuration of the window-to-wall interface at the perimeter of the assembly. Concealed conditions and deterioration may also be revealed. Removing selected windows, in part or as a whole, can also provide valuable information with respect to the assembly and components.

3 Restoration Approaches

Once the investigation has been completed, gaining an understanding of the owner's expectations is necessary to develop an appropriate restoration approach. While comprehensive restoration is ideal to achieve a consistent end result, it is often not necessary or justified. The approach will determine the maintenance cycle for the windows. Less invasive approaches will have a lower initial cost, but a shorter service life. Likewise, more invasive approaches will have higher initial costs, but a longer service life prior to required maintenance. Regardless of the approach, the cost of access and general conditions will generally be consistent. A combination of approaches could also be appropriate based on available funds, window location or exposure, or other factors.

Potential restoration approaches may include some or all of the following: scraping and painting; stripping and painting; performing localized repairs, dutchman repairs, and component replacement; reglazing with salvaged or new glass; hardware repair or replacement; and weather-stripping replacement.

4 Conclusions

A successful historic window restoration project requires a clear understanding of the existing window conditions and the owner's expectations for window maintenance and service life. When possible, a comprehensive investigation of the existing windows can more accurately customize a restoration approach that achieves the desired end result.

ORCID

Edward A. Gerns: <http://orcid.org/0000-0003-3640-4114>

Sarah K. Van Domelen: <http://orcid.org/0000-0002-1171-7862>

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