LYNDHURST GATEHOUSE  
Tarrytown, New York

The two-story stone gatehouse on the grounds of the Lyndhurst Estate in Tarrytown, New York, is part of a National Historic Landmark that was once the home of railroad magnate Jay Gould. The property is owned today by the National Trust for Historic Preservation and is open to the public. Built in 1864, the South Gatehouse is used as a private residence for a caretaker.

The windows, with ashlar surrounds on the first floor and decorative wood detailing on the second, are prominent features of the building. The original double-hung wooden windows, with two-over-two pane configuration, have survived in relatively good condition. The 13 windows in the gatehouse are of five different sizes; all but one have an arched head in the upper sash and a thick vertical muntin with a center bead.

The windows on this structure were fitted with custom-made exterior storm windows that meet specified performance criteria and yet minimize both damage and visual obstruction to the historic windows.

**Design Problem**

In many buildings where the historic windows are significant and will be preserved in the rehabilitation project, the installation of storm windows for energy conservation can require innovative features or some adaptation to standard window designs. This may be necessary in order to minimize damage to historic fabric and to preserve the visual qualities of the historic windows.

Such an approach was taken in the rehabilitation of the South Gatehouse windows at Lyndhurst. As guidance, the following criteria were established beforehand for designing the new storm windows:

1. The new design had to be sympathetic with the historic character of the building.
2. The windows needed to remain operable to allow for ventilation and also for use as possible fire exits.
3. Energy conservation objectives had to be met.
4. Only minimal damage to the historic windows could occur in mounting the storm windows and inconspicuous hardware had to be used.
5. Provisions had to be made for insect screens.

**Design Solution**

A storm window was subsequently developed that meets all of the above requirements. The storm window, in the style of a single casement, was installed on the outside of each of the historic win-
The single casement, wooden storm window had two removable panels for screen and glass inserts. This custom design fulfilled a variety of requirements established for the project with minimum physical damage and visual changes to the historic windows. Drawing: Martha L. Werenfels

In making arches for the five windows, a template of Masonite was first made for each. By fitting the template to the historic arch, it was then possible to trace the top of each on a piece of 5½" wide pine or cypress to make the top rails for each window.

Dowels were used to join the rails and stiles. Two holes for ⅜" by 2" dowels were drilled for each joint with the exception of the top rail. For the arch, only one hole per joint was made due to the lack of space.

Before the windows were fitted together, the inner moldings on the rails and stiles were cut on the shaper to match the 9/16" quarter mound molding on the historic sash.

**Figure 1.** The single casement, wooden storm window had two removable panels for screen and glass inserts. This custom design fulfilled a variety of requirements established for the project with minimum physical damage and visual changes to the historic windows. Drawing: Martha L. Werenfels

**Figure 2.** Section of the wood stile shows how the removable screen and storm panels are secured by use of aluminum clips. Also note that the storm sash was rabbeted along the inside edge to allow retention of original window molding. Drawing: Martha L. Werenfels

**Figure 3.** The only feature of the storm window that required expensive custom work was the pin-in-socket hinges (bottom one shown in photograph). Commercially available hardware could have been used; however this project sought to minimize physical damage to historic woodwork and thus tested a prototype design. Stainless steel was used for reduced maintenance costs. Photo: Richard Bierce, AIA

**Figure 4.** In fitting the windows together, the parts were glued at the joints with resorcinol glue, dowels inserted, and the clamps attached while the glue hardened overnight.
rabbet was cut along the outer edge to allow the window to fit over the existing moldings on the historic window frame. The windows were then fitted to each opening and bottoms planed to a slight angle corresponding to the sill. Two weep holes were cut in the bottom to allow condensation to escape, and the windows were permanently labeled as to their location in the building.

Custom-made stainless steel hinges of a pin-in-socket design were attached to the left side, top and bottom, of each window. The windows were then sanded, treated with a non-toxic preservative, and primed with an oil-alkyd paint.

**Inserts**

The two aluminum-frame storm inserts for each window were constructed of moldings cut on a mitre. The top pane of glass was cut to follow the arch of the top rail, and the units were then assembled and labeled. Screens were cut and assembled in a similar manner. The aluminum frames were roughened with sandpaper, and painted with two finish coats. After the paint had thoroughly dried, the storm inserts were installed with small aluminum hold-downs on the inside of each window.

**Final Installation**

In hanging the windows, ¾” holes were drilled in the sill and the top of the historic window frame to accommodate the stainless steel anchor. The holes were thoroughly soaked with the same wood preservative used on the sash, then filled with a polysulfide caulk before the anchor was inserted. After the windows were installed, 1 inch hook-eyes were attached to secure the windows shut while a second hook-eye, 1 foot long, was installed on each window to hold it in a fixed position when opened (see figure 5).

**Project Evaluation**

The storm window used on the gatehouse incorporates several desirable design features. It is a successful preservation solution by maintaining the arched head of the windows; proportioning the framing members along the basic lines of the primary sash; matching the materials of the historic window and avoiding damage to historic fabric. The casing design does not impede use of the windows for emergency egress, and the panel inserts set on the inside of the storm frame provide for convenient seasonal change from storm to screen units without relying on obtrusive multiple-jamb tracks. While the custom hardware is perhaps a luxury feature, for economy purposes standard hardware could have been substituted. The storm windows, moreover, are detailed so that almost any local mill could easily make them. This sensitive storm window design has widespread applicability to many other historic buildings where owners are seeking to maintain and upgrade the existing historic windows in an aesthetically pleasing and practical manner.

**PROJECT DATA**

**Building:**
South Gatehouse  
Lyndhurst Estate  
National Trust for Historic Preservation  
635 South Broadway  
Tarrytown, New York

**Project Date:** January-March, 1980

**Project Staff:**  
Wayne Trissler, Apprentice, and Joseph Lewes, Master Restorationist  
National Trust Restoration Workshop  
635 South Broadway  
Tarrytown, New York

**Materials:**  
Stainless Steel Hardware—Wesco F. G. Corporation  
Bridge Street  
Box 3  
Irvington, New York

**Project Costs:**  
The fabrication of the windows was undertaken by an apprentice at the National Trust Restoration Workshop at Lyndhurst. No cost figures are available.
This PRESERVATION TECH NOTE was prepared by the National Park Service in cooperation with the Center for Architectural Conservation, Georgia Institute of Technology. Charles E. Fisher, Preservation Assistance Division, National Park Service, serves as Technical Coordinator for the TECH NOTES. Special thanks go to Alan Keiser, Director of the National Trust Restoration Workshop for his time and assistance in providing information concerning the window work on the gatehouse. Thanks also go to the following people who contributed to the production of this TECH NOTE: John H. Myers and Laura A. Muckenfuss, Center for Architectural Conservation, and Preservation Assistance Division staff, particularly Kay D. Weeks, Martha L. Werenfels, Mae Simon, Michael J. Auer, and Martha A. Gutrick. Cover, Gatehouse Photo: Courtesy, National Trust for Historic Preservation.

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