Volume 5 Number 1 Winter 1989

Common Bond

A newsletter on maintenance and preservation for owners of architecturally significant religious buildings

Dear Reader:

We are very pleased to announce that the New York Landmarks Conservancy has chosen Edward Mohylowski as the new Director of its Religious Properties Program, and as such will serve as Editor of Common Bond. Mr. Mohylowski is leaving the position of Deputy Director of Preservation at the New York City Landmarks Preservation Commission, where he has worked for the past seven years in the areas of research and regulation. A Fulbright Scholar and graduate of Columbia University's Historic Preservation Program, Mr. Mohylowski brings to this position a familiarity with the issues, both technical and political, relating to the preservation of religious properties. We look forward to working with him in guiding and expanding the Conservancy's programs for religious properties.

The "Preservation Profile" in this issue features the First Presbyterian Church in the City of New York, which is undergoing a $2.54 million restoration. The process by which First Church came to recognize the need for major work on its buildings is a familiar story. The way in which the congregation has responded to this challenge, however, provides a good example of how careful organization and planning can contribute to the success of a major restoration campaign.

St. Peter's Episcopal Church in Chelsea is embarking on a major restoration campaign. This historic institution, and the work planned for its landmark building, is described in "In Brief".

The Rev. Thomas F. Pike
Chair, Advisory Committee

First Presbyterian Church, New York, New York

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order changes in the work by a written change work order. A change work order details any changes in the work or the scheduling and is signed by the owner and contractor, and the supervising architect, if there is one. This enables the institution to authorize changes to accommodate unexpected conditions, increases in the cost of a project, or an extension of the completion date, without having an entirely new contract drawn up. The change work order also allows changes in the drawings or specifications to be made. The cost of work executed under a change work order is usually determined on a unit price basis.

Concluding Provisions

To protect the contractor, the contract should clearly say that he cannot be held responsible for any delays caused by change work orders or any other causes beyond the contractor's control including labor disputes, fire, delayed delivery of materials, unusual weather conditions which affect a construction project, and unknown and unanticipated structural conditions.

Lastly, the contract should include any special conditions or provisions. In preservation work, it is a good idea to add a clause which calls attention to the value of the building and cautions the contractor of his liability for loss or damage due to carelessness or poor workmanship. The contract should close with the legal signatures of the owner and the contractor.

"Guidelines for Contracts, Parts I and II" outlines the provisions which should be included in contracts for most smaller scale projects. However, it is advisable to have any contract reviewed by legal counsel before signing. For larger projects involving significant sums of money, an institution should seek professional legal assistance in drawing up the contract. ■

Ask the Technical Preservation Services Center

Question:

Our community building has steel casement windows which are rusty and do not close tightly. How can we repair them and improve their energy efficiency?

Rabbi Gerald I. Weider
Congregation Beth Elohim
Brooklyn, New York

Answer:

Steel windows are often perceived as little more than a utilitarian alternative to wood windows. However, the delicate appearance of these windows--an effect produced by the mullions (the thin bars that hold the glass)--are an important design element of late-19th and early-20th century religious buildings. (Figure 1)

Steel windows were introduced in the late-19th century when improvements in steel manufacturing made them cost competitive with wood. Their fireproof properties also made them popular in urban areas. Like all building features, steel windows require regular maintenance and repair to remain in operable condition.

William C. Johnson

Figure 1: Steel windows are often highly distinctive in design and craftsmanship, and play an important role in defining the architectural character of many late-19th and early-20th century buildings.

Inspection

Before repairs are implemented, every window should be inspected to determine the degree of physical deterioration. Surface dirt and grease must first be removed. This can be accomplished by brushing or vacuuming the window, and then wiping the metal surfaces with a cloth dampened with mineral spirits or denatured alcohol.

While inspecting your windows, be alert to any signs of moisture penetration. Moisture will cause the steel elements

in the window frame and sash to rust, compromising their structural integrity. Check around the metal window frame and the adjacent wall surfaces. Also check each individual pane of glass to see if water is entering through cracked glass or deteriorated putty. Finally, make sure that the exterior sill slopes away from the window so that standing water does not collect against the window frame. (See the "Ask the Technical Preservation Services Center" column in the Spring 1988 issue of Common Bond for more information on proper drainage for windows.)

After checking for moisture penetration, determine the degree of corrosion in the frame, sash and mullions of the window. A light, flaky surface accumulation of rust which is easily brushed off indicates the metal below is in basically sound condition. (Figure 2) However, if the rust has a bubbly texture, the corrosion may have penetrated deep into the metal. A sharp probe, such as an ice pick or an awl, can be used to determine the condition of the metal beneath the surface. If the probe can penetrate deep into the metal and if brittle strands of corrosion can be pried out, there is a high degree of corrosion present in the window.

Besides rust, check the condition of the metal (are parts of the window bent?), the paint, the glass panes and putty, and the window hardware (screws, bolts, and hinges).

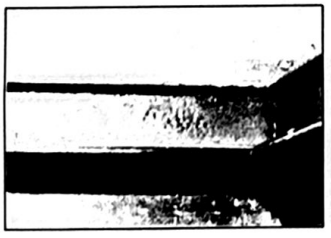

Figure 2: Although the frame of this steel window appeared beyond repair before rehabilitation, it was found to be in good condition once the debris was vacuumed and the surface rust removed with chemical compounds. Photos courtesy of the Nebraska State Building Division.

Repair

If the metal sections of the windows have only light rust, the windows can be rehabilitated by properly trained custodians or members of the congregation. First, remove flaking rust and excessive paint with a wire brush; paint the exposed metal with a rust inhibiting primer; replace cracked or broken glass and putty; replace missing screws and fasteners; clean and lubricate the hinges; apply a compatible finish paint over the primer; and caulk the gap between the metal window frame and the adjacent wall surfaces.

If the windows are heavily corroded, metal sections are bent, or the wall surfaces adjacent to the window are in need of repair, the services of a window contractor or building conservator will be needed.

Weatherization

Although steel windows are not generally as energy efficient as wood windows, they can be upgraded through the use of weatherstripping, the installation of additional glass, or the installation of protective acrylic panels. (It should be noted, however, that weatherstripping, caulking and secondary glazing will only be effective if chimney dampers, vents and other openings which allow warm air to escape from a building are closed during the winter months.)

The first steps in any weatherization process are the routine maintenance procedures discussed above. Repairing the windows, so that air infiltration through the glass panes is minimized, will go a long way toward making the windows more energy efficient.

The next step is the installation of weatherstripping where the operable sash meets the fixed metal frame. There are four types of weatherstripping appropriate for metal windows: spring metal clips, vinyl clips, compressible foam tapes, and caulking or sealent beads. (Figure 3) The type of weatherstripping to use will vary depending on the condition of the windows and it may be necessary to use more than one type on any given building. The thinnest weatherstripping available to fill the space where air enters should be used wherever practical. The use of unnecessarily thick weatherstripping should be avoided as it can interfere with the operation of the sash.

Spring metal weatherstripping, usually bronze or brass, is screwed to the window frames after they are painted. (Figure 3) This weatherstripping is thin and works well if the sash fits snugly when the window is closed; it will not work if there is a gap between the sash and the frame when the window

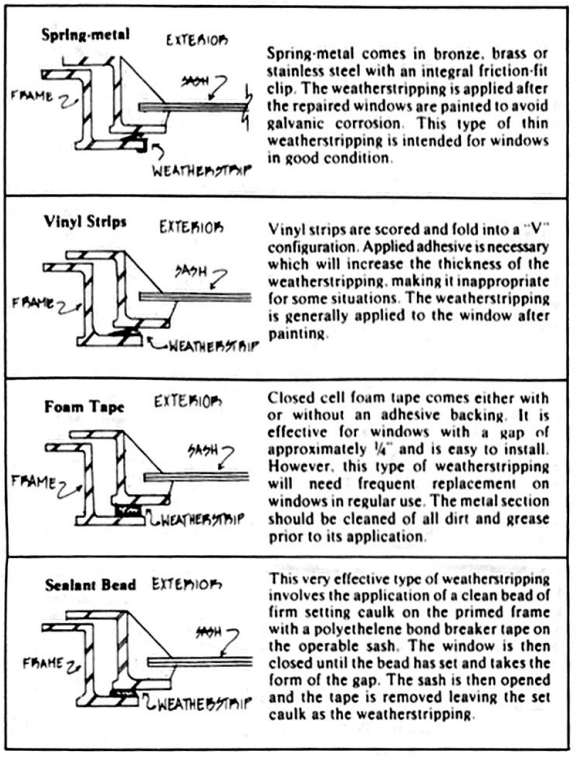

Figure 3: Appropriate types of weatherstripping for steel windows. Weatherstripping is an important part of upgrading the thermal efficiency of historic steel windows. The chart above shows the jamb section of the windows with the weatherstripping in place. Drawing: Sharon C. Park, AIA.

is closed. Spring metal weatherstripping should never be applied to unpainted metal as the joining of two dissimilar metals causes corrosion.

Vinyl strips work much in the same way as spring metal weatherstripping. (Figure 3) Since vinyl strips are applied using an adhesive backing (which makes the weatherstripping thicker), they are more effective in windows where there is a small gap when the window is closed. Like spring metal, this weatherstripping is typically applied to the window frame after painting.

Foam tape weatherstripping is also applied using an adhesive backing and works best on windows with a gap of about 1/4" when closed. (Figure 3) Unlike spring metal and vinyl weatherstripping which will last ten years or more, this type of weatherstripping requires replacement every two or three years.

One simple yet effective type of weatherstripping--called sealent bead weatherstripping--uses caulk to create an air tight seal between the sash and the metal frame. (Figure 3) Caulk which sets to a firm consistency is applied to the frame with a special tape to prevent it from adhering to the sash. (Ask your hardware store for a "firm setting caulk" and a "polyethylene bond breaker tape".) The window is then closed. When the caulking sets--usually in two to seven days--it takes the form of the gap between the sash and the frame. The sash is then opened and the tape removed, leaving the set compound as the weatherstrip. This type of weatherstripping works particularly well when the gap between the sash and the frame is irregular.

Another form of weatherization which is effective with steel windows is the addition of a second layer of glazing. This can be accomplished by adding a new layer of transparent material to the window, adding a separate storm window, or replacing the single layer of glass in the window with thermal glass (double glazing). In historic buildings, it is generally best to install additional glazing on the interior so as not to detract from the exterior appearance of the windows.

The most practical option for most religious institutions is to install an acrylic or glass panel on the interior over the original window. (Figure 4) This project can usually be executed by members of the congregation. The choice between acrylic and glass is primarily based on cost and the ability of the window to support the additional weight, glass being heavier than acrylic. The glass or acrylic panel can be placed over the entire window and secured to the frame if the window sash does not need to be operable.

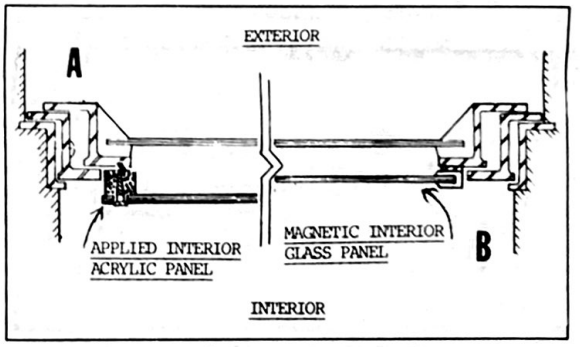

Figure 4: Two examples of secondary glazing installations which improve the energy efficiency of steel windows. Scheme A shows a 1/4" acrylic panel with a foam gasket attached the interior of of the outwardly opening sash. Scheme B shows a glass panel in a magnetized frame affixed directly to the interior of the windows sash. Drawing: Sharon C. Park, AIA.

If the windows are opened only in the warmer months, the panels should be installed so that they can be easily removed in the spring. Glass or acrylic panels can be set in frames and attached to the window frames using magnets, interlocking fabric strips (velcro),

screws or adhesives. This work should be undertaken by a general contractor or skilled members of the congregation. If the windows must be operable through the winter, separate panels can be affixed to each sash so that the window can be opened and closed.

Acrylic panels can be screwed directly to the metal window frames or sash, and do not require their own frame. (Figure 4) However, the screw holes in the acrylic should be large enough to allow for the expansion and contraction of both the metal and the acrylic. A strip of rubber or some other material should also be included between the windows and the additional panel to establish a thermal cavity to increase energy efficiency.

When adding secondary glazing to any window, it is essential that the space between the two layers of glazing be vented to prevent moisture condensation. This is best accomplished by making cuts of about 1/8" in size in the corners of the panel or in the rubber strip, so that the moisture which forms between the glazing layers can evaporate.

Storm windows and thermal glazing are more expensive energy conservation options and must be installed by a professional. If an institution opts for storm windows, they should be compatible with the original windows in both appearance and function. For example, if an institution has paired casement windows, horizontally sliding storm windows which are arranged to match the configuration of the casement windows should be used. (Figure 5) As with glass and acrylic panels, it is best to install storm windows on the interior rather than the exterior in order to avoid compromising the building's appearance.

Christina Henry

Figure 5: The horizontally sliding storm window placed over the inside of this casement window is practically invisible.

Replacing the old glass with thermal glass is the most expensive means of upgrading the energy efficiency of your old windows. However, if the old glazing is not ornamental--stained or etched glass--and if the old sash can tolerate the additional weight of double glazing, this treatment leaves the window fully operational while preserving its historic appearance.

Figures 1-4 are reprinted from Preservation Brief #13: The Repair and Thermal Upgrading of Historic Steel Windows by Sharon Park for the Technical Preservation Services Division of the National Park Service. Figure 5 is reprinted from "Tech Note 15", courtesy of the Georgia Institute of Technology.

WE WANT TO HEAR FROM YOU. PLEASE CALL THE TECHNICAL PRESERVATION SERVICES CENTER WITH YOUR QUESTIONS: (212)995-5260. ■

Technical Services for Religious Property Owners

SACRED TRUSTS II: MONEY, MATERIALS AND MANAGEMENT will be held May 17-20, 1989 in Detroit, Michigan. Like the Sacred Trusts conference held in Philadelphia last April, Sacred Trusts II will be presented as a series of working sessions divided into three tracks. Series A/Money will look at a variety of fundraising approaches available to religious institutions undertaking repair and restoration projects, ways of increasing existing income, programming for maximum income, and protection of assets, all with a view toward easing the financial problems of religious institutions. Series B/Materials will focus on the repair of the physical fabric of religious buildings, including stained glass, pipe organs, decorative arts, liturgical furnishings and the structure itself. Series C/Management will focus on the use of the physical plant and how to plan for its future upkeep. Experts on each of these topics will present the sessions and be available for consultation during the course of the three-day conference.

In addition to the working sessions, several special events will be held during the course of the conference including tours of Detroit's