FYI No. 3

RETROFITTING HISTORIC WINDOWS

Updated 15 June 2002

Old windows frequently are primary sources of heat loss. Broken glass, loose glazing compound, warped sash, etc., deterioration of old elements. . . . Additionally, many old windows have only a single thickness of glass. . . and substantial gaps between elements, allowing significant infiltration. A variety of retrofit techniques can provide a historic window with thermal efficiency equaling or exceeding that of typical replacement window units. These methods are generally less expensive than wholesale replacement, and they can insure that the greatest amount of historic material is retained in a rehabilitation. Reworking historic window sash for proper fit and operation, installation of high quality weather-stripping, additional layers of glazing, and storm windows are common means of resolving this problem.

Storm Windows are often part of effective window retrofitting procedures. Storm window treatments should be consistent with the character and detail of the historic window opening and overall facade. New units must completely fill the window opening without the use of infill panels. Meeting rails and mullions must align with those of the primary window sash. Glazed areas should match the configuration of the primary sash where possible. In most applications, tinted glass or glazing films should not be used.

When interior storms are used, sufficient ventilation must be provided at the historic prime sash to avoid moisture condensation that will damage the historic window elements. The correct approach to using interior storms is to create a seal on the interior storm while allowing some ventilation around the primary window.

Where the above concerns can be met, the following storm window treatments may be appropriate:

a. Exterior wood storms.

b. Exterior or interior aluminum storms with a factory-applied baked enamel finish to match the prime sash and exterior window trim colors. Bronzed or "silver" mill-finish treatments are generally not appropriate.

c. Interior storm units which do not damage historic materials.

Additional glazing is another way to increase the thermal performance of existing window units. Multiple glazing layers can be provided by the following techniques:

a. The routing of existing sash to accept new (removable) interior or exterior "storm panels." In divided or multi-paned sash, interior panels allow for an undisturbed exterior appearance.

b. The installation of permanent additional glazing, usually implemented with heat-activated desiccant compounds which provide the required moisture control between glass layers.

The additional glazing adds weight to the sash. If the sash operates with sash pulleys and counterweights, the counterweights should be augmented to compensate for the increased weight of the sash.

Other energy measures should always be considered as part of an overall package. The goal of appropriate weatherization measures is to increase the thermal efficiency of the overall building envelope while retaining all repairable historic material in place. The following techniques may meet these criteria and should be explored:

a. Extra insulation in attic, ceiling, and basement locations.

b. Caulking.

c. High quality weather-stripping at doors and windows.

d. Efficient mechanical systems.

e. Insulation of ducting and piping.

ADDITIONAL INFORMATION REQUEST: Please specify or provide:

1._____ Location and description of all window retrofitting techniques.

2._____ Manufacturer's literature for all window retrofitting techniques.

3._____ Location, material, finish, and configuration for storm window units.

4._____ R-value estimates for retrofit options versus all others.

5._____ Life-cycle cost estimates for repair and retrofit options versus all others; estimated pay-back period for each option.

PLEASE NOTE: Inappropriate window retrofitting techniques may result in loss of

architectural integrity and denial of certification for Certified Historic Rehabilitations. Please contact the Department of Historic Resources at (804) 367-2323 if you require assistance.