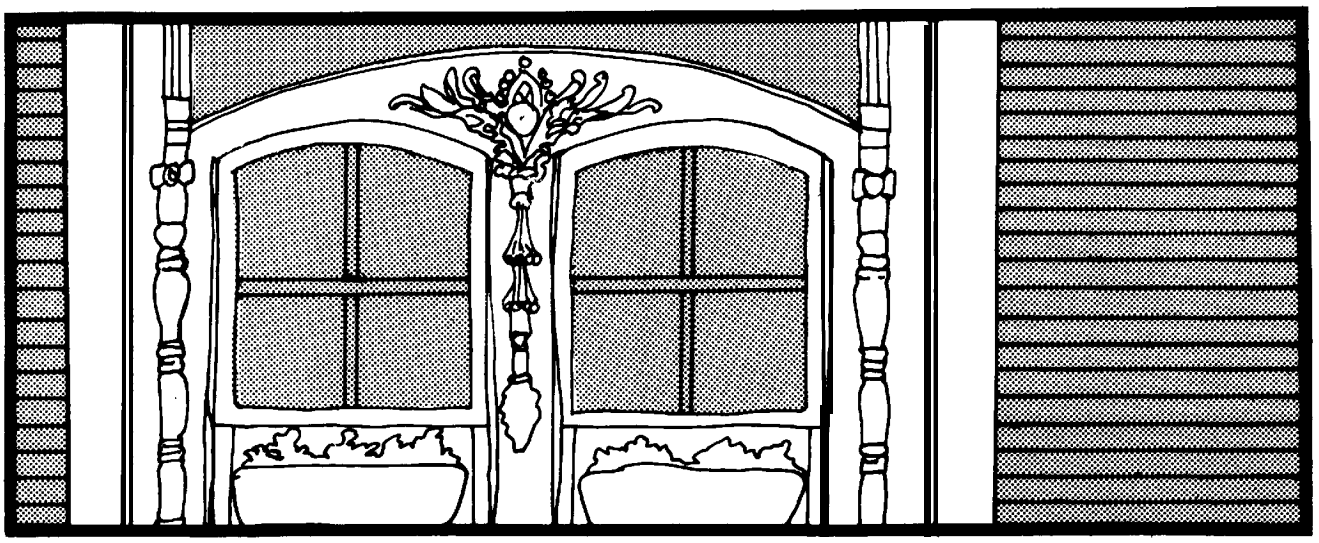
LOW-COST WINDOW REHAB



Look at each window individually for the most economical treatment

by Robert Santucci

The wood double-hung window has been the standard choice for more than 200 years in residential structures.

Recently, steel (see "Coping with Steel Casements"aluminum and PVC have offered alternatives, but wood or wood-clad windows still dominate in new residential construction, so that's what we'll discuss here.

In rehab, our first decision on windows comes after a thorough inspection. The goal is to come up with the least expensive way to put a window back into shape—a way that balances requirements for light, ventilation, access, energy loss, aesthetics, and long-term maintenance.

One At a Time

The most cost-efficient way to look at window rehab is to deal with each window individually. A single-family home might involve eliminating three openings, replacing the sash in four, and making minor repairs and adding weatherstripping to 12.

With the addition of premium storm windows, the result is a home with at least 20 years of future window service and a major decrease in infiltration—at half the cost of total window replacement. Short of total replacement or elimination there are three kinds of window repairs:

- Permanently closing the window
- Repairing the sash, weatherstripping and storm sash
- Replacing the sash and channels

Permanent closure

This is the least expensive alternative for non-working or poorly working wood double-hung windows. It's done by screwing the sash to the frame, caulking the exterior perimeter with silicone, and filling the sash-lift pockets with poured insulation.

The result is a very efficient, low-maintenance window. Although it no longer opens for ventilation, it still lets in light and looks like a window—an important consideration when you're dealing with historic zoning rules.

The addition of a storm sash is recommended in almost all climates.

This was the chosen option for two of the three 7x3-foot windows in the living room of a Baltimore rowhouse. The middle window was reworked using the best sash of the six available. In the remaining 13 windows, every top sash was screwed shut and caulked from the outside. Four of the lower sash required replacement and all the windows got a single-hung aluminum storm sash. The result was a $2,250 savings in the bid price when compared to 16 new aluminum windows.

Repair and Weatherstrip

In almost all situations involving wood double-hung windows, it is less costly to repair, weatherstrip, and provide storm/screen sash than it is to install new double-hung, double-glazed windows or sash.

This method also saves energy. The

TO REPLACE OR NOT TO REPLACE

A builder faced with windows deteriorated beyond cost-effective repair can either eliminate the window and cover the opening, glaze the window with fixed panels, or install a new window. Most specifiers will automatically choose the last option. But when specifying for low-cost rehab, each opening must be considered separately, and carefully.

Eliminate the window. The average 1920 to 1940 house contains 21 windows, but only seven room areas. The average room needs only one to two windows, so in the case above, you could close up seven openings with wall material on the inside and match the exterior finish on the outside.

A 2x4-inch stud wait with 3½ inches of fiberglass insulation has an R factor of 15—eight times greater than a double-glazed wood window, which is R-1.6. So energy savings alone could make the closure worthwhile.

In addition, replacement window systems are expensive and require three to five times the maintenance of the surrounding interior and exterior wall surfaces.

Older, detached single-family frame houses derive the most benefit from eliminating window openings. But make sure you follow these guidelines when deciding which windows to do away with:

- Check your local codes to see how many window openings are required per room.
- If you are working with row houses, window elimination may be more difficult. If the house has only two window walls, eliminating openings is not advised.
- If removing windows creates dark corners in rooms, elimination of openings is not advised.

Fixed glazing. Replacing windows with fixed, factory-sealed double gazing may be preferable to eliminating the opening, and less expensive than repairing the old window.

First, you have to compare the costs of fixed glazing versus replacement. You also have to consider whether the light from the opening — whether fixed or repaired— is necessary for the individual room. Fixed glazing gives an open feeling to a room, and stops heat and cold infiltration. However, it also stops ventilation. For that reason, it is a good choice for rooms with mechanical ventilation, such as bathrooms and kitchens.

Downsizing an opening to fit stock windows saves both in replacement costs and energy use.

This 1920 frame house had two of its 23 windows removed to avoid expensive repair.

Compare Costs: Replacement Windows

Window Type	Double Glazed Cost*	Single Glazed/ Storm Cost*	Maintenance	Comments/Recommendations
Double-hung wood, average quality	$170-$210	$165-$190	Paint.	The least-expensive is wood with a storm panel. This also is the most energy-efficient, although it has the highest maintenance cost. This kind of window works best in combination with an aluminum storm window. **Advantages:** Wood is a good thermal insulator. It comes in custom shapes and sizes. Natural or historic appearances are possible. It can be painted, and durable factory coatings are available. **Disadvantages:** Components are subject to expansion with moisture. They require painting and other care at regular intervals. They have thicker frames and sashes than metal windows.
Thermal-break aluminum sliders.	$140-$205	$155-$200	None.	This is the least expensive single-unit option. **Advantages:** There is a wide choice of colors for coatings. Units are light-weight. There is some flexibility in shapes and sizes. They have very low maintenance. There is a variety of extruded sections available for frame and sash members. **Disadvantages:** Unless thermally improved (with "break" in frame between inside and outside), these windows are subject to heat loss and condensation. Custom shapes and sizes are not available.
Double-hung clad wood, PVC double-glazed only.	$205-$245	NA	None.	This option is more expensive than painted wood and may have less life span than maintained wood. **Advantages:** Combines the strength of wood and the durability of vinyl. Windows have very low maintenance and are very strong. They are available with good trim and fitting kits to fit various openings. **Disadvantages:** There is a limited choice of vinyl colors, especially in the darker ranges. Custom shapes and sizes are not available. Vinyl can he broken by accidental blows, but can he repaired.
Aluminum single-hung thermal-break	$180-$205	$185-$235	None	Compares favorably with aluminum sliders. This is the most energy-efficient aluminum and is the recommended replacement choice for double-hung openings.
Double-hung solid vinyl	$205-$260	NA	None	**Advantages:** Very durable. Few components are subject to moisture retention or decay. They are a good insulator and come in a wide variety of colors. **Disadvantages:** They can be expensive.

*Costs are Rehab Work Group's estimates, based on 1985 R.S. Means' figures.

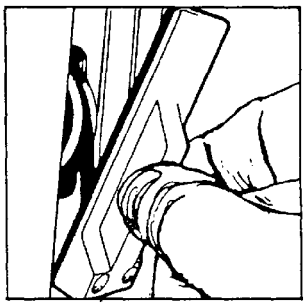
Replacement Windows. Replacing entire windows, although the most expensive move, may be necessary when the existing windows are beyond repair—and when elimination and fixed glazing is not appropriate.

Considering that the average house has 20 windows and the average apartment has ten, total replacement costs could run between $4,000 to $5,700 per house, and $2,000 to $2,800 per apartment unit.

Replacement prime windows are available with aluminum, vinyl, or wood frames; single, double or triple glazing; sliders, casements, single-and double-hung. When you factor in different models from manufacturers, there are thousands of choices. (The American Architectural Manufacturers Association sells "Window Selection Guide," for $16 ppd. Write to AAMA, 2700 River Road, Des Plaines, IL 60018.) The chart is provided to give you an idea of the costs for a few of them.

—RMS

average R-value of new double-glazed windows is 1.7 to 1.9. The repaired, weatherstripped window with a storm sash is 2.0 to 2.3. As the accompanying chart shows, the repair and weatherstrip method also costs less than replacement. (Low-e glass can change the economics—a cost-benefit analysis may show that because of energy savings the extra cost of low-e glass might be worth it.)



Installing pully covers can stop air infiltration.

When applying weatherstripping, remember that spring-metal strips nailed to friction points are recommended for any window that is opened more than ten times a year. For windows that are rarely opened, a closed foam or felt weatherstripping should suffice.

Don't forget sash locks in your repair considerations. A sash lock is not only a security device, but it also aids insulation by pulling the two sash surfaces together. Inexpensive locks are usually sufficient as long as they are properly installed.

Replacing Sash and Channels

The sill and sash usually begin to deteriorate first—the sill from constant exposure to water, the sash from mechanical damage. After repair or replacement of the sill, it is easy and cost-effective to install a sash replacement kit.

A kit contains a new wood double-glazed, weatherstripped sash and wood sash guides custom-fit to your opening. Sash kits can be installed easily by people with limited carpentry experience.

If the old sash used weights and sash cords, remember to fill the void with insulation and tape across the pulley before installing the new sash.

Because the replacement sash are made to order, they can compete favorably with any custom-made window. For standard-sized openings, it's cheaper to replace the entire unit. And in the case of bulk orders of units with the same measurement, you can expect substantial discounts.

Sometimes, it's not the old window that needs repairing or replacing, but the channels it slides in.

The best kind of replacement channels are made of vinyl or aluminum. Although these kinds of channels eliminate a window's stops, beads, and balance system, they hold the sash in a snug friction fit. And when installed correctly, they make a window nearly airtight.

Avoid low-cost, low-quality channels. It's better to use high-quality replacements. They cost only $1.25 to $2 more per opening, and ensure satisfactory service for 20 or more years.

Storm Windows

One great thing about storm windows is that they preserve and protect the older windows that came with the house, and can allow you to save the original windows. Even rough original sash can gain years with the protection of outer storm windows.

Make sure that the old windows are repaired with steel mending plates, cracked glass is replaced, and everything is glazed and painted before you install permanent storm windows. Insulating storm windows that outperform most prime windows are available.■

Robert Santucci was the research coordinator for The Cost Cuts Manual: Nailing Down Savings For Least-Cost Housing *in which this material originally appeared. The manual covers the entire process of rehabbing housing and is published by the Enterprise Foundation. It is available for $45 ($35 for non-profits) by writing to Rehab Work Group, P.O. Box 1490, Alexandria, VA 22313.*

Compare costs: window renovation

The methods and costs here are for wood double-hung windows and assume the windows are 35-65 years old, 14 sq. ft., with no weatherstripping or storm panels.

Method	Cost/ window*	Service life	Energy savings**	Comments
Prime & paint with brush.	$36	6 yrs.	None ($0)	Most expensive method, along with new sash.
Repair sash & install weatherstripping.	$121	5-15 yrs.	16% ($9.50)	This is the minimum to be done to all windows.
Repair sash & install weatherstripping & exterior storm panels.	$185	20-30 yrs.	21% ($12.50)	Most cost-effective renovation because it lowers maintenance and energy costs. Even more cost-effective for self-help projects.
Install single-glazed wood sash.	$181	25-40 yrs.	16% ($9.50)	
Install double-glazed wood sash.	$245	25-40 yrs.	18% ($10.70)	High initial cost and high maintenance cost.
Replace window with non-movable double glazing.	$135	40-60 yrs.	30% ($16.62)	Good choice when adding windows for solar gain.
Replace window with a 2x4 wall, insulated with R-13 fiberglass.	$129	60-100 yrs.	70-85% ($38-$46)	Least-expensive and most energy-efficient renovation method is to do away with window altogether, especially on north-facing side. Good self-help project.
New double glazed aluminum Thermobreak window.	$273	40-60 yrs.	25% ($13.85)	High initial cost but excellent long-term investment.

* Costs are Rehab Work Group's estimates, based on 1985 R.S. Means' figures.

** Annual savings for heat only. Figured by estimating the cost of gas furnace use at 50 cents per therm. Savings are compared to single-glazed window in poor condition in 6000 degree day climate.

COPING WITH STEEL CASEMENTS

A lot of products seem like a good idea when introduced, but after a few years, their problems become obvious. Steel casements is a good example.

Introduced in the 1930s, it was soon discovered that they do everything a window *shouldn't* do.

They leak air and water, they transmit heat and cold, and they are prone to breakage.

There are only two cost-effective ways to deal with faulty steel casement windows: replace them, or abandon them.

In other words, don't even try to repair them with weatherstripping, paint, or new crank mechanisms. It costs more than it's worth.

Replacement. A new double-insulated aluminum slider can be installed for 10 to 20 percent less than major repairs could cost. The best replacement is a low-cost, double-glazed, aluminum single-hung or sliding-glass window, manufactured locally to American Architectural Manufacturers Association (AAMA) standards.

Still, there may be cases where it would be extremely costly to remove a steel casement window. In such cases, cut the muntins with a torch or power saw, leaving just the frame.

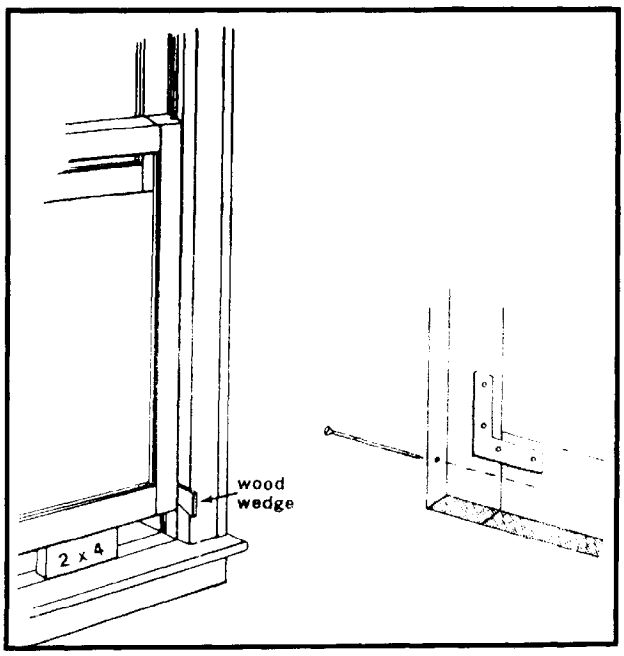
The replacement window should be designed to butt up against the old casement jamb. You can use a decorative cover flashing or panning on the frame.

Abandonment. The least-expensive way to deal with deteriorating or non-working steel casement windows is to shut them permanently.

This is accomplished by removing the hardware—cranks, etc.—and using metal screws to fasten the opening to the frame. You can then cut down on heat and cold infiltration by installing free-standing interior storm sashes. This method is recommended as a low-cost alternative, particularly for multi-family buildings. It not only provides good insulation, but offers superior security.

Parts. If you are dealing with steel casement windows that must remain operable, you will have to find a source for new parts. Blaine Window Repair Service. 3831-F Plyers Mill Road, Kensington, MD 20895 sells 18,000 parts for more than 1,200 different assemblies.

—RMS



You can repair a sash without removing it with a wood wedge and metal corner plates. Remove stops, apply glue to crack, and drive the wedge to tighten the sash. Be careful not to crack the glass. While the wedge holds the sash, fasten 2- or 2½-inch flat corner brackets into position.