

# THE CARE OF LEADED STAINED GLASS WINDOWS

By Kevin O'Brien

**T**HE CARE OF LEADED stained glass windows falls into three categories: repair, maintenance and restoration ("complete re-leading").

## REPAIR

Repair is most often needed as the result of something breaking, whether through an accident or because of decades of use without maintenance.

### Glass Replacement

Most glass replacement takes place because of a hole in the window or when a piece of glass is shattered and there is a danger of the glass falling out. When changing a piece of glass with the window in place, the lead is opened up to slip in the new piece of glass.

The revival in interest in stained glass has made even more stained glass available for use in repairs. And many of the more popular colors from days past are still available in production today. The variation of colors in the opalescent stained glasses also helps replacement glass match up. If an exact match is impossible, use the choice of glass that is a shade darker. Because darks recede and lights advance, the darker choice is often less noticeable as

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being a replacement. Also match the texture of the glass and run the grain of the color in the same direction as its neighboring pieces.

Most churches would be surprised to find out just how much cracked glass they have when they really start looking. Tiny cracks don't show up in normal viewing. Generally the time for the wholesale replacement of every piece of cracked glass in a window is best left to the re-leading process when the window is totally disassembled. That is the best time for a thorough search for the replacement glass and a flawless insertion.

## MAINTENANCE

Maintenance to properly fabricated and installed stained glass windows is usually not a serious concern for the first 60 years or so.

Most stained glass windows will not require serious maintenance for about the first 80 years. Some of the more called-for services are as follows:

### Cleaning & Inspection

Be advised that stained glass windows generally do not clean up as well as regular windows. If the stained glass is covered with storm windows, then it probably won't be cleaned on the exterior until the storm windows are changed. Some stained glass is intentionally flawed with pits, lines or other irregularities. The same flaws in the stained glass that can lend uniqueness or char-

acter to the window may often trap small amounts of detritus. Usually these are only noticed under careful inspection. Glass can also stain after years of slow baking in the dusty sun. The original grout lines along the lead may not be perfect either. My goal is to remove 85 percent of the dirt and detritus.

Often when bid work on older windows, I make a detailed list of the major bulges, missing braces, etc. Then I bid on the interior cleaning of the window with a blanket clause to take care of the many smaller items that are routinely encountered during cleaning but that can not be easily foreseen otherwise.

Sometimes the cleaning process is necessary because work may be performed to a section of the window that requires cleanup afterwards. This is especially true in changing glass or cleaning up fluxes that are used in brace installation. When you clean that section of the window following the work, the rest of the window can look dirty, so cleaning the whole window can be a good idea.

### Bracing

All large leaded stained glass windows require steel reinforcement bracing to help support the weight of the window and to keep it straight and unbending. Modern bracing is a flat (usually 1/8" x 1/2") pre-tinned steel that is soldered directly to the stained glass window. Older stained glass windows frequently require repair or replacement of their

*(Continued on page 24)*

(Continued from page 23)

original bracing as well as supplemental bracing. I try to keep the bracing uniform and logical in appearance for both immediate and long-term needs of the window.

#### Bulge Straightening

The bending, bowing, puffing or "bulging" of a stained glass window is the loss of vertical alignment of the leaded glass panel when weight loads of the window shift. Left unattended, the bulges can worsen, causing the cracking or shattering of glass and pressuring the lead joints to stretch and break. The careful correction of window bulges and their causes requires thoughtful attention to improper weight loads, insufficient bracing and defective leading.

#### Re-cementing

Stained glass windows derive much of their strength from the cement grout, which fills in the lead tracks around the glass edges. Driving rains, time and the contraction and expansion caused by the extremes of temperature cause a loss of the waterproofing cement—especially on the exterior side. The process of re-cementing replaces missing window grout, refurbishes the lead, and restores the shine to the window.

#### RESTORATION

When windows are more than 80 years old they may look like candidates for re-leading, which is the most complete restoration process. Windows vary in how gracefully they age, but broken lead joints, mismatched glass from previous repairs, suspicious areas of daylight showing through, copious amounts of bracing to shore up an aging window and general deterioration are all signs pointing to the need for complete rebuilding.

The windows being removed need to be catalogued to be sure that they go back into the right places. Photographic recording is a good idea as well. When

the windows are removed there is usually a storm window in place to keep out the elements, and sometimes we will install a tarp in the opening to control for the flood of light.

If possible I transport the stained glass in the wood sash insert that it is set in. Older windows can be very fragile when removed from their framework. Either way, care must be taken.

In the studio, using a shop paper and carbon paper, impressions are taken of the lead outlines. The window is then completely disassembled and the old lead is discarded. The carbon "rub-bings" are used to arrange the pieces of the disassembled window and as a pattern to rebuild the window. Sometimes a rare piece of glass can be saved by inserting a thin lead between the two cracked pieces. Generally though the cracked glass is thrown out and new stained glass is substituted. Sometimes if I have several like windows to rebuild I will arrange to borrow pieces from one window so that the other windows can be rebuilt using totally original glass. Then I will use the best substitute color in the remaining window in a consistent manner so that it appears to be natural and original. Special care has to

be exercised in matching and handling original pieces of painted stained glass. Some hand-painted pieces can require up to ten kiln firings for restoration work. It can be time intensive.

The lead available for restoration work today has the ability to last significantly longer due to new formulas. The addition of copper to the lead, for instance, will help the lead to resist fractures as it ages.

At this point the window is assembled much like any new window. In its new glory it will appear to you in much the same way that it appeared to previous generations and it will last longer the second time around. Protective storm coverings are another reason to expect longer life from today's stained glass window.

In summary, if your church may be a candidate for stained glass repair or restoration, check for these main signs of deterioration: bulging or sagging of the window, loose braces, areas of daylight showing through, mismatched or broken glass, loss of grout in the lead or general poor condition. If such is the case, it may be time to address these needs. *Fi*

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