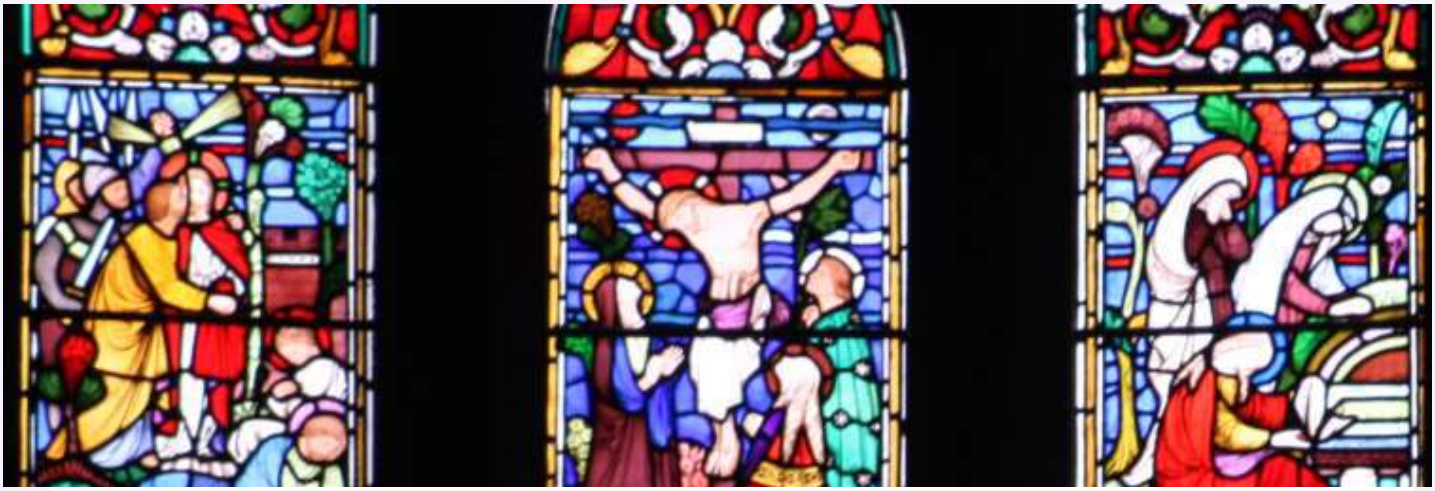
Guidance note
Protective window guards

ChurchCare

16,000 buildings. One resource



Where windows are vulnerable to **physical damage** because of their fragility or because of a history vandalism or break-ins in the neighbourhood, protective guards may be considered. They need to be **compatible** with the church architecture and as **reversible** as possible.

The main types of protective guards are:

- metal wire guards
- polycarbonate (clear plastic) guards

Metal wire guards may provide a useful solution to the problem of physical damage, but they may call to mind an industrial building and the impact to the building needs to be addressed:

They can be visible from the inside, looking out: in the case of leaded lights, the building becomes a 'cage'; and in the case of stained glass, lightly painted sections can be compromised by a grid of unwanted lines.

If fitted over whole multi-light windows, including mullions, tracery etc., the appearance is dreadful: they should always be fitted to each light separately.

They reduce the transmitted light.

The feeling that they are out of context is exaggerated if a silver/grey finish is used, but greatly reduced if they are finished in black.

They do not give protection against someone armed either with an airgun or with a hammer in one hand and a spike (e.g. screw driver) in the other.

Galvanised ferrous metal (steel) wire guards
The following points should be taken into account:

Unless regularly maintained, they will rust and this can cause serious staining to stonework. The damage can be irreversible, short of major stonework repairs. Cases are known where rust has penetrated one-and-a-quarter inches (32mm) into the stonework.

Non-ferrous wire guards
The cost of guards in copper or stainless steel is higher than those in galvanised steel.

All the points listed above apply equally to copper guards. The only difference is that the staining will be green rather than red.

Stainless-steel wire guards secured with stainless fittings eliminates the problem

Because the raw material is more expensive than galvanised wire, manufacturers will sometimes skimp on the specification and produce a guard lacking in rigidity.

Powder-coated wire guards
Powder coating gives good protection to ferrous-wire guards and offers a longer life span than the galvanising process.

There is a real architectural advantage to the black finish of powder-coated guards. The outer surface of stained glass naturally has an overall black finish and so the guards to some extent 'disappear'.

The top of the range wire guard is one made of stainless steel and powder-coated in black.

Polycarbonate guards
When shields of rigid clear plastic polycarbonate were first introduced, a number of grave mistakes were made both in the design of the guards and the fittings. Amongst these were:

It was being fitted in large sheets covering stonework as well as glass, which was aesthetically and technically unacceptable. Sometimes sheets of only 4mm thickness were used.

Due consideration of the large coefficient of expansion (0.5%) was not given, so that buckling and damage occurred. Although polycarbonate is virtually indestructible by the action of external forces, it can break itself up, if restrained, by the internal forces of expansion.

The buckling led to distorted reflections of light.

The fittings used were of poor quality materials, such as aluminium.

The sheets were sealed into the wall or into frames, thereby producing unventilated cavities. Often the frames were of poor quality materials. (Possibly the function of protection against damage was confused with that of double-glazing).

Sometimes the polycarbonate was introduced as a misguided alternative to restoring a leaking window.

The large sheets fitted by contractors with all their equipment and manpower were difficult to remove for access.

The design of polycarbonate guards can be greatly improved, technically and visually, if the following standards are applied.

The guards are made of 6mm thick polycarbonate sheet.

The guards are cut to exactly the same shape as the 'sight size' of the glazing; all stonework is exposed and the area of reflection is reduced to a minimum and confined to areas where, visually, glass is expected anyway.

They are fixed on brackets of unpolished stainless steel with fittings of stainless steel and nylon. The fittings allow for the expansion of the polycarbonate. No frames are to be used.

The guards are made in small panels that can be removed for access if needed and which allow for a free flow of air, thereby not encouraging the problems of condensation or the growth of organic matter. Each panel of polycarbonate might be, say, only 36 inches by 18 inches and, conceptually, these small units relate well to other 'building bricks'. Thus, the modern material is less at odds with the architecture of the building.

This design also allows for expansion with temperature. The spacing between adjacent panels should be 10mm.

However the following disadvantages remain:

The reflection of light can give the building an unpleasant 'blind' look. This is somewhat more acceptable if the plane of the sheet material is preserved and the reflections undistorted. The problem is not so apparent at the more sheltered windows of the church.

The polycarbonate can be deliberately scratched or disfigured with graffiti.

Unlike wire guards, the long-term properties of polycarbonate are not known. Possibly they will last for twenty years. An investment in these might well not be as sound as an investment in stainless steel wire guards that (if well maintained) are likely to put in at least a hundred years' service.