Lafayette Presbyterian Church	Brown Baptist Memorial Church
	
	

2. Glass and colors: material and techniques

All the techniques listed below testify of the fact that a very high degree of artistry was required throughout the fabrication of Tiffany's stained glass window.

The glass
The glass palette is rich and varied, including drapery of rippled, mottled and opalescent glass. The rich, translucent blue and opaque pink drapery glass of the gowns of the figures is beautiful. The leaves are made of different tones of rippled transparent and opalescent glass

and the pieces of glass chosen for the trunk of the tree are a wonderful example of the dexterity of the artist to match the goal of representing a tree without using paint. The ensemble makes a great variation of tone and density.

Wonderful combinations of layers of these types of glass have been used (see the document "palette of colors"):

- Amber hammered cathedral glass
- Streaky opalescent green and white, purple and white, pink and white, blue and white
- Rippled green and white
- Clear antique flashed glass red on transparent (used with acid etching)
- Casts of dalle de verre
- Transparent blue drapery glass
- Opalescent red drapery glass
- Opalescent pink drapery glass
- Blue wispy semi-opalescent glass
- Assorted full and semi-opalescent glass

Plated glass

The window is plated and has numerous layers of glass (up to three) on top of each other. The plates are used to allow tremendous control of the light that passed through the window. It gives the artist a full range of colors and tonality, and also a three dimensional sensation, which are not possible when using a single layer of glass. The plates are mechanically held to the panel with several dimensions of leads which are adapted to fit the uses needed. There is no use of copper foil in this window. The size and shape of the plates can be very different. One plate can be covering a whole area made out several pieces of glass. The plate will then give strength to the tonality of color used in the whole area (see document "Etched and plated glass").

Etched Glass

Some of the plates of this window are flashed glass which have been acid etched. In some cases, this was done to reinforce the shapes, folds and shadows in the draperies (a red flashed glass behind pink drapery glass); in one other case, it was done to add a figure in the background. The combination of the two plates creates a very beautiful and effective image with a sensation of depth (the acid etched plated glass is added behind the window). (See document "Etched and plated glass").

Glass cutting

High level of expertise was needed in the cutting process to reach the art of those undulating and sculptural shapes.

3. Painting process

Hand Painted Glass

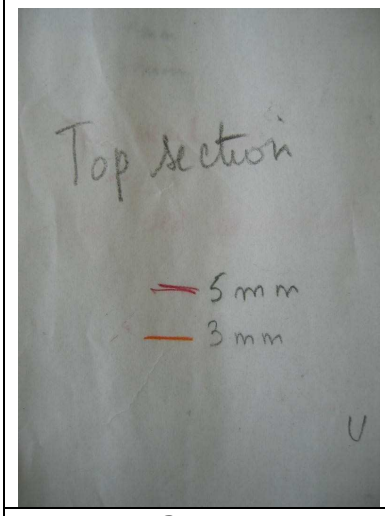
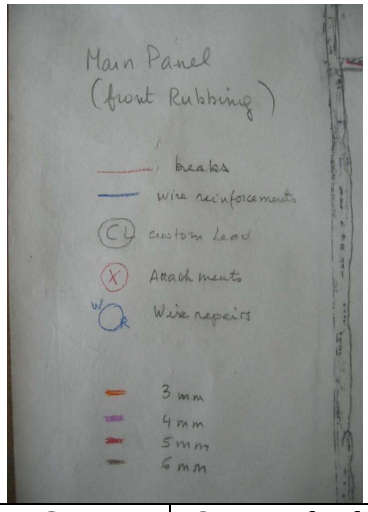
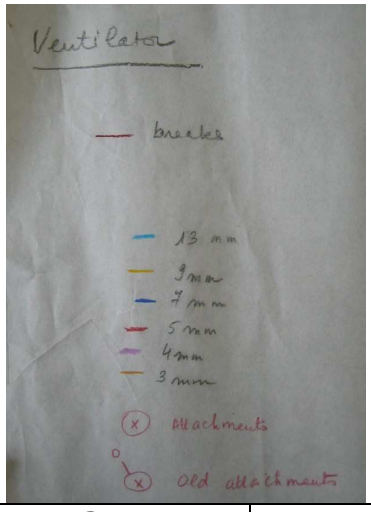
Although Tiffany mostly preferred to use only non painted glass, playing with the numerous plates to match the colors and textures he wished to reach, the flesh figures would be painted. Even if the painted parts have suffered tremendously of paint loss, the faces of the Good Samaritan and of the wounded man remain exquisite. The painting is first rate. Vitreous paints and a small amount of enamels are used to define the faces, hands and feet of the two figures and the donkey.

Tiffany Studios would usually use transparent glass to paint the flesh parts and add a plate of semi-opalescent behind it. What is rather unusual is that the paint has been applied directly on

opaque opalescent glass. According to David Frazer, it probably shows that the painter was not a glass-painting specialist.

4. Leading (glazing) process

Leads
There are numerous sizes of leads used and the way the leads are cut and glazed shows that the highly-skilled craftsmen of the Tiffany Studios had developed very sophisticated techniques. They did not use the leads in a traditional way; they would adapt nearly each piece of lead to match their needs with the plated or drapery glass. Tiffany Studios glaziers were considered to have a 'secret' in making strong windows.

<table>
<tr><td>Top panel</td><td colspan="2">Main panel</td><td colspan="2">Ventilator</td></tr>
<tr><td colspan="5">Before restoration</td></tr>
<tr><td> 
</td><td colspan="2"> 
</td><td colspan="2"> 
</td></tr>
<tr><td>3 mm
5 mm</td><td>3 mm
4 mm
5 mm
6 mm
8 mm</td><td>6 mm U-lead
Custom lead</td><td>3 mm
4 mm
5 mm</td><td>7 mm
9 mm
13 mm</td></tr>
<tr><td colspan="5">Leads used during the restoration</td></tr>
<tr><td colspan="2">13 mm
9 mm
5 mm
2 mm U lead

The top panel is not been re-leaded, except for the borders.</td><td colspan="2">4 mm
5 mm
5 mm
6 mm HH
4 mm U lead
H lead HH
The main section is not been re-leaded, except for the borders</td><td>4 mm
5 mm
11 mm
U-lead 2 mm cut into half to make an L (for the front plate)

This section is completely re-leaded.</td></tr>
</table>

5. Conservation efforts

In order to preserve the history and the artistic integrity of the window, the principles of using the least invasive techniques and retaining the original materials will be chosen. The leads and their particularities (custom leads, flange) will be kept as much as possible as witness of the skills of the Tiffany studios craftsmen.
The top and main panels of the window will not be re-leaded except for the borders. The only parts of the main panel which will remain untouched are the four capitals on top of the columns. This will make the window stronger. The upper wing of the leads will be peeled away leaving the heart and the wing of the lead in its original state. Each piece of glass will be copper-foiled, put back and floated. The exterior part of the panel will then be soldered together. The borders will be re-leaded.

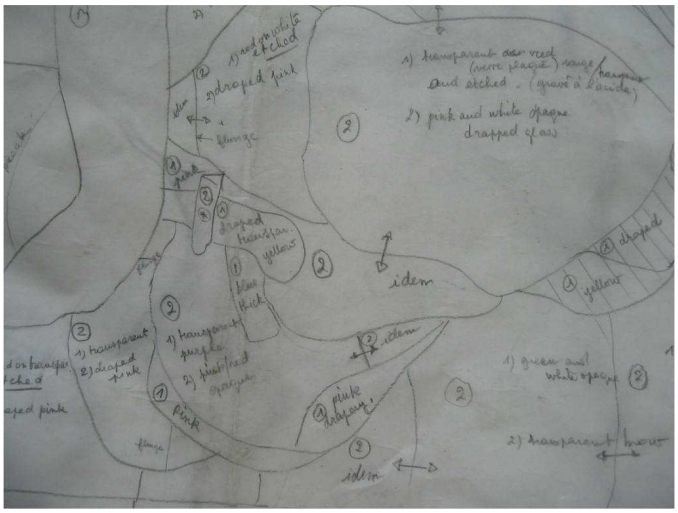
The broken glass will likewise not be replaced, but mended with adhesives or with copper foil when it can't be avoided.

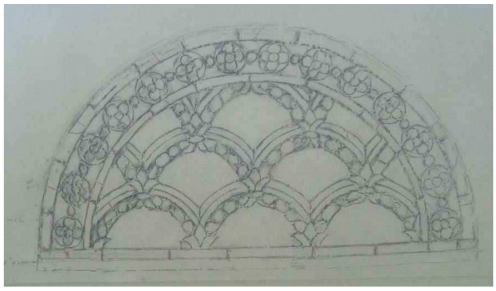
IV. The restoration's process

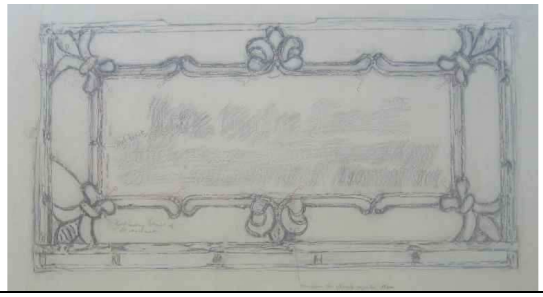
1. Documenting the window

1. Rubbings

The work begins by placing the main panel on a piece of foam on the work bench. A velum rubbing is made with wax crayon of the interior of the panel. The rubbings insure that the original configuration is retained and that the window will not change, nor expand during restoration. Perimeter leading and placements of the plating are indicated. The panel is then turned the other way round and a rubbing of the exterior is done. A subsequent rubbing of the four lower plated areas is made so that the removed glass can be placed back in the layer from which it came. The plated pieces are taken apart and another rubbing of the exterior without the plates is made.
Rubbings of both sides of the top panel and the vent section will also be done.







A rubbing on brown paper, showing the exterior dimensions, is made too, and will help with the re-glazing.

As it was impossible to put stickers on the pieces of glass during the cleaning process, another rubbing was made during the dismantling. This rubbing is completed with indications of the colors of the different layers of glass. This helped to not get the pieces of glass mixed up when put back together. Even if this process takes a while to do, it is worth completing it.

2. Leads, cracks, notes

Cracks of the glass, types and sizes of leads are indicated on each rubbing. The measurements of the leads are done with a caliper. Notes on special areas are taken.

3. Pictures (photographic documentation)

Reflected light photographs are taken from the front and back of each sections of the window. Detail photographs are taken of severely damaged or intricate lead sections. The photographs are made with a Canon Ixus 400, digital camera.

2. Dismantling the window

1. Health recommendations

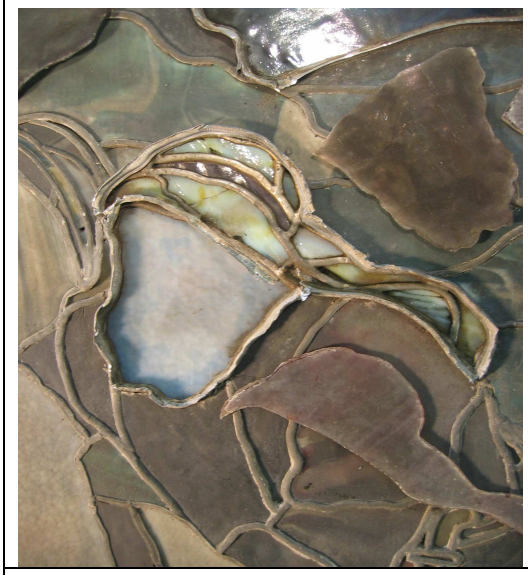
This part of the restoration process being the most hazardous in terms of lead contamination, great care must be taken to keep the area as clean as possible with constant use of a vacuum cleaner. The use of masks, Tyvek overalls and gloves is highly recommended.

2. Flattening and de-leading

The panel is laid on a big piece of wood and borders of wood are screwed in the bench all around the panel. This will avoid the panel to extend and fit the right dimensions.

The support bars and the attendant wires are removed from the obverse side.

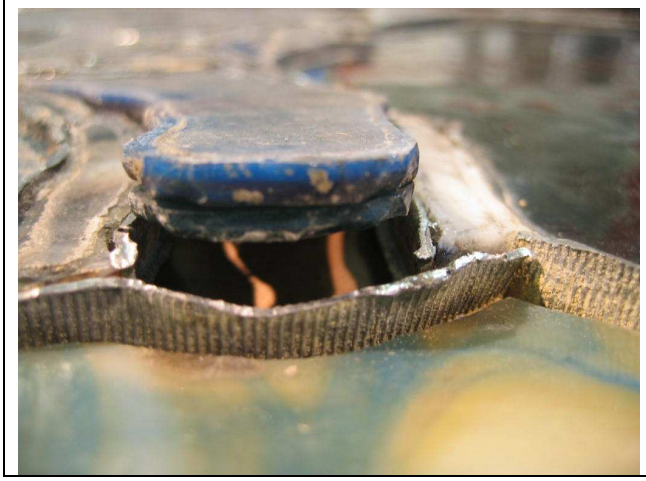
The de-leading process begins with the removal of the four plated pieces on the exterior side. The putty is picked away from underneath the leads with hardwood picks and dentistry tools. Then the wings of the lead are lifted up in order to remove the glass pieces. Once the pieces of glass have been removed, the leads remaining are cut.
Cutting the leads is difficult because the plates are attached to the panel with a lead that has been floated to the leads underneath.

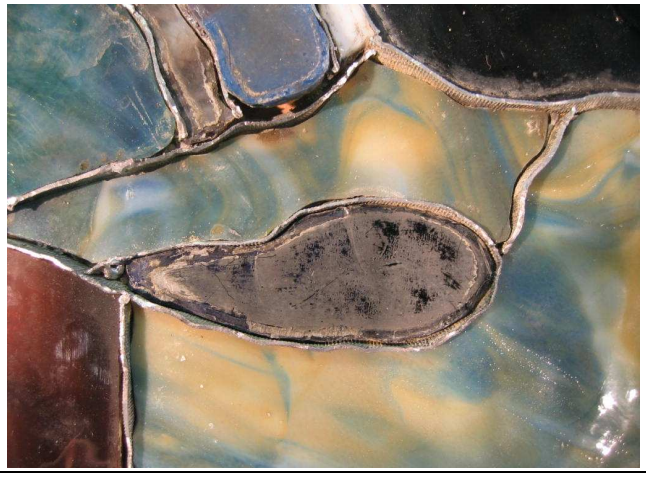


The wings of the leads have been lifted up to remove the plated piece of glass.	A lead has been soldered on top of the other one to hold the plated piece of glass.

The next step is to peel away the upper part of the wing of the lead leaving the heart and the other wing. This is done using a very sharp knife “Outil parfait” and a little hammer if needed when the lead has been floated. When necessary, the solder points will be de-soldered using the iron with oleine. Although the floated leads must first be cleaned with a metallic brush to get rid of the oxidation.
The knife is held very flat and attention must be paid during the entire process to avoid breaking the glass pieces.

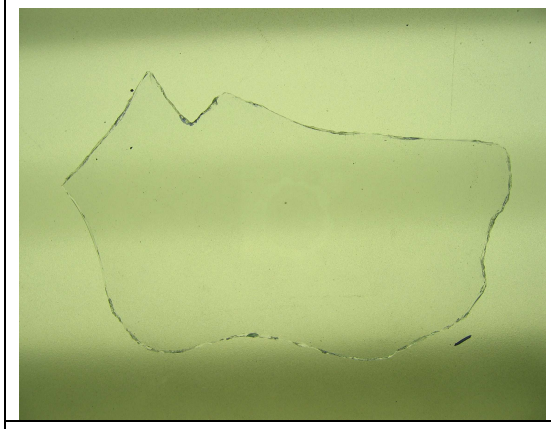
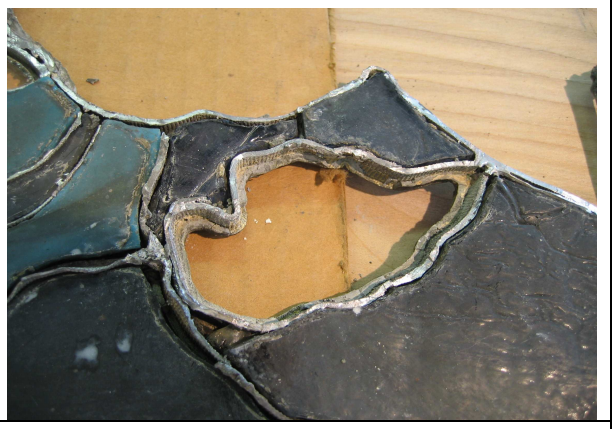
The upper wing of the lead is peeled away using a sharp knife, leaving the heart and the lower part of the lead.



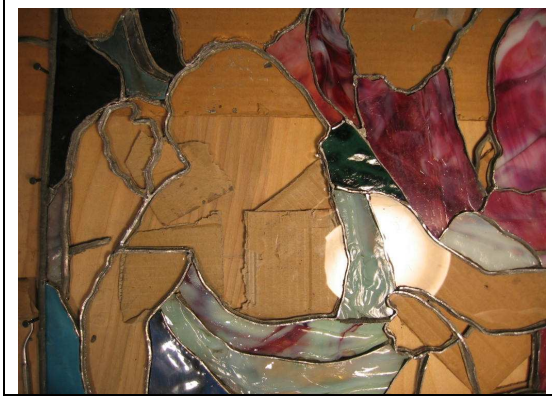
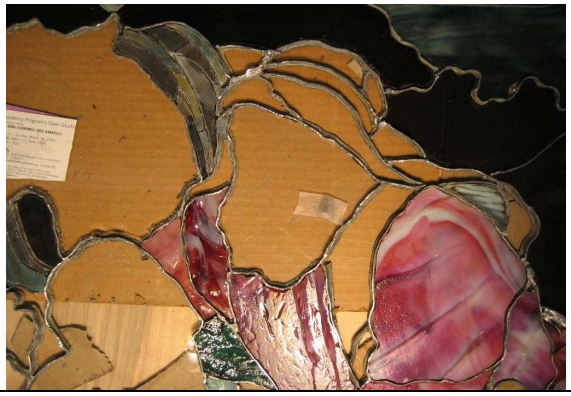


Each piece of glass of the first layer removed is then laid on a glass tray in its exact location on the panel.

To avoid any accident, the painted pieces are removed of the panel as soon as possible. They are laid on a glass tray and put away in a draw. Plates of clear glass will be cut to replace them in order to keep the structure of the leads very tight while the restoration process is going on.
The tightness of the structure is very important because the panel must not expand, and the leads must remain at their exact location to keep the integrity of the panel. The leads will also be patted with small pieces of cardboard underneath to maintain them at the good level.

When all the leads have been peeled and that the pieces of the first layer have been removed and laid apart on a glass tray, the second layer is also removed and laid on another tray. The naked structure of the leads appears very clearly.

During all this process, the putty that remains on the leads is to be vacuum-cleaned as often as possible. Thought, some of the putty, in exceptional cases, will be kept. It keeps tracks of the height and the location of the piece of glass when there is just one layer.

Attention must be paid during all the restoration process by using a strainer on top of the pipe of the vacuum cleaner not to loose any piece of glass.

3. Pictures of the painted pieces before cleaning

The painted pieces have been laid on a tray. Before starting the cleaning process, reference pictures must be taken in natural, transmitted and reflected light. Frames are made with cardboard following the shapes of the pieces. They are also laid and taped to a glass tray.