

RESTORATION OF THE HAWAII TEMPLE FRIEZES

Justin Fairbanks, son of Avarad Fairbanks, who originally performed the art work throughout the temple described how he was invited to come to Hawaii to restore the work of his father. Brother Fairbanks told about the difficulties encountered by those who were first commissioned to do the paintings and other art work for the temple in 1918. One man felt overwhelming failure when his fresco would not dry properly on the canvas that had been stretched on the wall, others found their style or colors incompatible with the building or the brethren. Finally, his father, a newly arrived proselyting missionary to Hawaii, was selected for the task of conceiving and executing all the paintings for the ordinance rooms and the baptismal area, and the sculpture pieces that made up the frieze band around the top of the building, the oxen for the baptistery, the memorial to maternity at the head of the reflecting pools and the blessing of Joseph by his father, Lehi, in the wilderness. Though the choice of the young artist seemed to have been a miracle not based on an already apparent talent, the choice of the son to repair and restore his father's work was the choice of a well-established expert in the field. As a professor of art at the University of Arizona, Brother Fairbanks accepted the commission not only to serve the Lord and help to make His house beautiful, but also, to understand the work of his father, whom he had not been privileged to know but briefly in his childhood. The almost 60 years of exposure to the corrosive elements prevalent in the islands had done considerable damage to the sculptures outdoors. Through a series of slides Brother Fairbanks showed examples of arms, legs, even heads of some of the statues in the frieze that had succumbed to the pressure of re-bar expanding as it rusted. He exposed cracks that were growing a variety of vegetation and detailed the problems caused by using incorrect and too many layers of paint. Brother Fairbanks and his assistant worked with a crew of craftsmen, mostly students at BYU, to remove the old layers of paint that had obscured the fine chiseled detail of the characters represented. The work was meticulous and tedious, but the reward was the uncovering of a veiled masterpiece. Brother Fairbanks explained the meaning of each frieze and some of the symbols used by his father to enhance the impact of historical events described in the scriptures.

RESTORATION OF THE HAWAII TEMPLE FRIEZES

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in consultation with
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The restoration of the friezes on the Hawaii Temple was a larger and more comprehensive project than originally thought; the nature and cause of the damage and the need for and nature of repair has been much more extensive than originally thought.

This report is prepared to provide an understanding of the nature of the problem which caused the need for restoration, the nature of the restoration completed, and recommendations for future consideration in the care of the friezes.

Nature of the Construction of the Friezes

In his description of the Hawaii Temple, D.M. McAllister¹ stated that locally available volcanic rock was used in the cement concrete to construct the Temple. The concrete was reinforced with steel throughout, and the cement was dressed by pneumatic stone cutting tools once it had hardened adequately. McAllister does not specifically address the nature of the construction of the friezes, nor does the Church Architect's Office have specific information as to the nature of the construction of the friezes.

The nature of the construction of the friezes had a bearing on the method used to repair them; therefore, it was necessary to determine how they were constructed. If the friezes were constructed separately, they may be able to be removed from the Temple, repaired, and then remounted. If they were constructed as part of the actual cement pouring, they could not be removed for repair; the repair work would have to be completed with the friezes still mounted on the temple.

Preliminary examination both inside the upper part of the Temple and of the friezes themselves revealed no seams which lead to the conclusion that the friezes were poured at the same time as the Temple--the friezes were essentially part of the Temple.

As the removal of the paint progressed, however, seams in the sculpture work became apparent, and it was decided the Temple and the friezes were constructed separately. The friezes were poured on the ground with steel rebars running vertically and horizontally to hold the friezes together while they were lifted to the Temple and while the Temple behind and above the friezes was being constructed. The friezes were tied to the temple with protruding rebars and

¹D.M. McAllister, A Description of the Hawaiian Temple of the Church of Jesus Christ of Latter-day Saints, Salt Lake City, 1921, pp. 3-4.

bolts with lead washers. It is our understanding that Brother Allen Erekson, Church Architect, agreed with this conclusion during his on-site inspection in June of 1987.

While this method of construction was different from that method originally decided upon, it still did not allow the friezes to be removed from the Temple for repair. The repair work had to be completed with the friezes still mounted to the Temple.

Removal of the Paint

Because the sculpture was constructed of concrete, only certain methods to remove the paint and preserve the quality of the art work could be used. No substance could be used which might eat into the concrete. Therefore, the use of acid and sandblasting were ruled out. Perhaps applying water pressure, hand cutting and scrapping, applying heat, or a combination of these methods could be used. After consulting with people who live and work in Hawaii, it was decided to experiment with some of these methods of removing the paint. Cutting and scraping alone was too slow and too tedious; water pressure by itself would not work unless the pressure was so high it would damage the art work; heat softened the outer layer of paint, but smeared the layers underneath.

The method of removing the paint finally decided on was to use Jasco paint remover followed by water pressure at 1,000 psi. The paint remover softened the paint and the water removed the soft paint. Because the friezes had been painted approximately four times, it was necessary to apply the paint remover at least three times. Any paint remaining which needed to be removed was removed by hand scraping.

It appears the friezes have been washed with two different types of cement wash, and have been painted with two coats of green (one light and one darker) and one coat of off-white paint since they were originally constructed.

As the paint was removed, additional cracks in the friezes were uncovered and in some cases pieces of sculpture came off--heads, pieces of flags, parts of hats, etc. Thus, it became readily apparent that the renovation of the friezes would take more time and effort than originally thought. It would be necessary not only to remove the paint and patch the cracks, but also to determine the cause of the cracks and to eliminate the cause as much as possible before the repair work could be done and the friezes repainted.

Nature of the Damage to the Sculpture Work

Several things have compositely worked toward the deterioration of the friezes on the Temple. Some of these are weathering, improper maintaining, improper repairing, and improper painting.

The major destructive element on the Temple friezes is rusting of the rebars used to hold the sculpture together when they were set in place. Moisture has reached the rebars from a number of avenues--accumulation of water, deterioration of the protective quality of the paint, weathering or cracking of the sculpture, deterioration of the repair work, elimination of the original drainage system, etc. This moisture has caused the rebars to rust and swell. This swelling has caused the concrete to crack which has allowed additional

moisture to reach the rebar which has caused additional rusting, which has caused additional swelling, etc.--a vicious cycle of deterioration has been set up.

It appears in some cases that the rebars were placed so close to the surface of the concrete that the moisture seeped through the concrete into the rebars.

There is evidence that some repair work has been done on the friezes prior to each painting. Some of this repair work seems to have been of high quality, while some seems to have been inadequate to prevent deterioration. In one case, roofing nails were used, perhaps to help hold the patch or rebar in place. The rebar and the nails were rusty underneath the patch and the concrete was moist. In some cases the materials used were inadequate and insufficient attention was paid to retaining the initial drainage system. In some cases pieces of sculpture which had previously come off had been reattached with an adhesive which caused the reattached portion to protrude slightly. An attempt was made to putty it over without adequate attention to the artistic endeavor nor to the proper drainage.

Once the paint was removed, rather large gaps were exposed along some of the seam lines and along the top of some of the friezes. While these gaps had previously been filled, it appears the materials used did not keep the moisture from reaching the rebars and rusting them.

When improper materials were used, when the contour of the original sculpture was not maintained, when insufficient attention was paid to the original drainage system, the repair was cosmetic but allowed additional and increasingly rapid deterioration.

It appears that inadequate attention was given to protecting the building and sculpture when the roof was mended. Droppings of tar were located on the friezes. These droppings were simply painted over rather than being removed.

The deterioration of the friezes in some cases was so extensive that lizards--"Geckos"--and their eggs were found underneath the cracked concrete. Some of the heads of some of the characters on the friezes were held in place with very little concrete, or adhesive, or paint. All or parts of three heads came off during the initial examination and probing. Additional pieces of sculpture came off as the paint was removed.

It is estimated by this restoration team that had the friezes gone an additional six months without some attention, several heads and other pieces of sculpture may have fallen off by themselves, perhaps falling through the roof in some cases.

An interesting observation is that there are cracks in the cap of the Temple at nearly every location when the rebars are rusted. These cracks were within a few inches of the seam lines of the friezes. This restoration team is not prepared to make a statement as to cause and effect, but only to make a statement of observation.

Nature of the Repair

Once the paint was removed, it became apparent the damage to the sculpture work was greater than originally thought. Therefore, the repair needed to

restore the friezes was much more than originally presumed and planned for.

After consulting experienced people in Hawaii, it appeared the following procedure for repairing the friezes was the most effective and long lasting:

1. Expose the rusted part of the rebar causing the deterioration and remove it.
2. Once the rusted part had been removed, paint the exposed tip with rust-resistant paint.
3. Coat that area cut away to expose the rusted rebar with acrylic which acted as an adhesive.
4. Fill the cut out portion and coated area with a grout mixture of acrylic and silica sand.
5. Fill the small cracks and weathered and minor damaged areas with a cement created by a mixture of acrylic and a portland-type cement.

Acrylic was chosen over epoxy for the repair work because epoxy tends to break down under the ultraviolet rays of the sun in Hawaii, and because acrylic has breathing as well as adhesive properties.

It was decided to remove sections of rusted rebars rather than to attempt to recondition them because it was estimated that whatever reconditioning could be done would most likely last a maximum of five years before causing additional problems.

Only the rusty portion of those rebars used to maintain the friezes while they were being hoisted into place were removed. No rebars used to tie the friezes to the Temple were removed, nor were any rebars in the Temple itself removed.

No attempt was made to remove all rebars which might be rusty; only those which apparently were causing difficulty were removed. Since there are no records as to the exact location of the rebars in the friezes, it was necessary to attempt to tell which rebars were causing the problems. This was done by examining the friezes once the paint has been removed. Those areas where there were cracks and apparent bulges were suspect. In nearly every case, rusty rebars were located at these locations. In all, approximately 52 pieces of rusty rebars were removed. These pieces of rusty rebars varied in length from approximately 3" to 24".

A brief summary of the extent of repair on each of the Temple friezes is presented below:

North Frieze--	6 sections of rebars removed; 1 head removed and reattached.
South Frieze--	11 sections of rebars removed; 2 heads and 1 arm removed and reattached.
East Frieze--	11 sections of rebars removed; 4 heads removed and reattached;

the head and 1/2 of the torso of Jesus Christ removed and reaffixed.

West Frieze-- 24 sections of rebars removed; 3 heads removed and reaffixed; 2 feet removed and reaffixed.

It should be pointed out that not all cracks in the friezes were caused by rusty rebars. Some cracks were caused by weathering, some were created in the original casting, and other reasons. These cracks have been repaired and should be monitored as part of the regular maintenance program.

It should also be pointed out that particular attention was given to filling the cracks and gaps along the top of the friezes because rain runs down the cap above the friezes, and where possible, back to the friezes.

Painting of the Friezes

The various coats of paint previously applied to the friezes have nearly eliminated the facial and other detail, thus making it difficult to understand the message portrayed by these friezes.

In order to retain the facial and other details, the friezes were brush painted. This method of painting not only allowed greater retention of facial and other detail, but also allowed a more even coat of paint.

Each frieze was painted with two coats of white acrylic paint. The sculptures were highlighted to give a greater sense of depth.

Future Monitoring

In order to provide a record of what has been done and what should be considered in the future, many photographs have been taken and are included in this report.

In addition to these photographs, copying machine enlargements of photographs of each frieze accompany this report. These enlargements show:

1. Where the rebars have been removed.
2. Places repaired.
3. Areas which need to be carefully watched in the future.
4. Places where concrete was removed and repaired.
5. The location of the seam lines.

Recommendations for the Future

This restoration team recommends the following:

1. Allow this team to inspect the friezes, without cost, within one year to determine how well the repair work is holding up, to look for evidence of additional deterioration and possible needed repair work, and to make recommendations for future restoration and/or

maintenance.

2. Retain the original sculpture by placing it on a regular inspection and maintenance schedule as recommended by the restoration team upon conclusion of their visit mentioned in Recommendation 1.
3. The models of friezes between the Distribution Center and the Genealogical Library are made of plaster and are in poor condition. Some figures and parts of the bodies are missing. Some places are almost washed away from the weather. It is not worth the effort to retouch them only to have them weathered away again.

This team would recommend that flexible molds be made of those in the temple chapel (which are the same) and they be cast in white resin. This would make them permanent and they could be placed anywhere. Since the molds would be flexible other castings could also be made.