

The Consolidation  
of  
Plain Face Plaster  
at  
Notre Dame Cathedral  
Ottawa, Canada

by  
Historic Plaster Conservation Services Limited  
[www.HistoricPlaster.com](http://www.HistoricPlaster.com)

Notre Dame Cathedral was built over 50 years between 1830 and 1880. Only the front façade and lower side walls are of solid masonry construction. The interior is heavy timber framing covered with wood lath and plaster. Ornament is hollow slip-cast plaster of Paris.







Faux marble finish on plaster columns



Faux finishes were done in a naive and exuberant style probably by artisans who had never seen the real thing.



14 thin walled slip cast plaster crockets adorn the plaster ceiling rib directly over the altar.





# PLASTER RIBS CRISSCROSS THE CEILING



A RIB CUT OPEN FOR  
INVESTIGATION



SEEN FROM ABOVE





Sawn wood lath and lime based plaster covers the vast area of the ceiling.





# Typical Cross-section of a Wood Lath Plaster Ceiling



DATE REC'D  
SAMPLE  
NO. 8





After a thorough vacuum cleaning technicians test the individual plaster keys by tugging gently on the lugs.







NAVE ATTIC  
SAMPLE  
AREA  
# 8  
INPS DATA RECORD  
NOTRE DAME  
CATHEDRAL





When the coal fired heating system was removed back in the 1960's, the badly deteriorated chimneys were cut down to below roof level. All the soot from that demolition was evenly spread throughout the attic. All of it, and all the other junk that accumulates over a century had to be removed prior to consolidation of the plaster ceilings.







After a thorough vacuum cleaning technicians test the individual plaster keys by tugging gently on the lugs.













## CONSOLIDATION

The technician is spraying a dilute solution of Rhoplex MC 76\* over the attic side of the ceiling.

The solution is

Rhoplex dissolved in Methanol.

Three applications are made to complete the consolidation

15% Methanol / 85% Rhoplex

30% Methanol / 70% Rhoplex

50% Methanol / 50% Rhoplex

This is followed by a final application of neat Rhoplex

\*Rhoplex is an acrylic emulsion manufactured by Rohm and Haas Limited.

- The diluted Rhoplex readily soaks into the very porous plaster.
- Depending on porosity, some resin may leak onto the surface through existing cracks. This means that the finish putty coat of plaster is being successfully re-bonded to its coarse plaster matrix. The flooding of the porous plaster allows the resin to find its way to where it is most needed.
- Where valuable decoration exists on the plaster surface, great care is taken to prevent leaks from remaining on the surface. In some cases, the resin application is reduced to syringe volumes.
- Complete evaporation of the Methanol occurs within 24 hours depending on temperature and the volume of fresh air we are able to push through the attic. This leaves the acrylic resin to coalesce over the next few days thereby binding the grains of sand and lime together.
- Once consolidated, the plaster can readily be adhered to its wood substrate with an adhesive concocted from the same resin.





The HPCS adhesive is put in place carefully and only as a replacement for missing lugs and keys.

## ADHESION

The adhesive is gun applied to replace the missing keys and lugs after the plaster is consolidated.

The adhesive consists of a mixture (by volume) of:

1 part Fluid Petroleum Coke

1 part Microballoons

1 part Agricultural Lime

Turned into...

3 parts Rhoplex MC 76

A large drum mixer is used and the resulting concoction is degassed and packaged in commercial caulking tubes as shown.







Conservation Team, Notre Dame Cathedral

# ESSENTIAL SAFETY GEAR



- Chromair System® Personal Exposure Badges for Methanol
- Respirator with Organic Vapour and dust filters
- Personal Single Gas Monitor worn on belt
- VOC sensors at various location on site