



## **Consolidated Plaster Ceiling in Colonial Building Passes Strength Test After Serious Water Infiltration**

ST. JOHN'S, March 15, 2016 – Historic Plaster Conservation Services Limited (HPCS) announced today that a plaster ceiling the company consolidated in 2009 was accidentally flooded with water in 2015 and yet still easily passed a structural load test. The testing revealed the water had no negative effect on the structural integrity of the plaster. The consolidation treatment process protected the ceiling from what may have otherwise been a great loss.

The 1850 Colonial Building is a Provincial Historic Site that is to be recommissioned as a museum of Newfoundland's political history, and has been undergoing an ambitious restoration project coordinated by Stantec Architecture. The landmark building is the most significant in the province and is renowned for its intricately finished interior, particularly the ceilings of the Council Chamber and Assembly Room.

In 2009, HPCS was commissioned by the Newfoundland Tourism, Culture and Recreation Department to preserve the ceilings in these two grand rooms with a treatment method called 'plaster consolidation.' The method involves the application of a polymeric binder (acrylic emulsion) to the reverse side of the plaster. The binder adheres the plaster to the wood lath substrate and saturates the plaster system, which is greatly strengthened. This treatment method was chosen because it could be applied from the reverse side of the ceiling without disturbing the important historic finishes in the rooms. HPCS and Stantec Architecture were joint recipients of an award from the Canadian Association of Heritage Professionals for the successful project.

In 2015, a number of very observable stains began to appear on the ceilings of both the Council Chamber and Assembly Room. HPCS was summoned to conduct an inspection and confirmed that the ceilings had been flooded with water.

"We've been consolidating plaster ceilings since 1983," said Eric Stewart, president of HPCS, based in Port Hope, Ontario. "But we've never encountered a flood like this on a ceiling we had already treated. This is the first time we've been asked to reassess consolidated plaster. We couldn't determine how strong or intact the ceiling was in our traditional way. So we recommended an engineered 'pull test' to determine if the water had compromised the strength of the ceiling."

The protocol for the test was developed in the United States by Dean Koga (Building Conservation Associates) and Ken Follett (Quality Restoration Works) who have experience in testing consolidated plaster ceilings. They developed a controlled method for quantifying the load-bearing capacity of ceilings of this construction.

At the outset, the decision was made to conduct the pull test on the Council Chamber ceiling because it had suffered the most water infiltration. It was determined that a safe load-bearing capacity for this particular type of ceiling plaster is approximately 30 pounds per square foot, which equates to the weight of the plaster plus a safety factor of five.

### **Test Result**

The pull-test revealed that the plaster could withstand 128 pounds per square foot before failure. The failure occurred within the plaster matrix itself but there was no failure of the bond between the plaster and wood lath. It was therefore concluded that the consolidated plaster, even after experiencing water infiltration, could support the weight of the plaster, plus a safety factor of at least 25 times.

“I was surprised and really happy with the results,” said Stewart. “The test provided us with some very positive information. First, our method of consolidation appears to improve the plaster’s resistance to water. And second, in this case the treated plaster’s structural integrity was not diminished by infiltration of water. We are very happy the province chose to consolidate the ceilings when they did because we’re pretty sure this would have been a much different story otherwise.”

### **About HPCS**

Historic Plaster Conservation Services (HPCS) pursues opportunities in the very specific field of architectural plaster conservation. The company addresses and repairs the structural problems of fragile plaster in historic buildings. Over the years, it has developed and patented an array of specialty products, techniques and tools, designed to strengthen and re-attach existing plaster on ceilings and walls. HPCS pioneered plaster consolidation in the 1980s and has since successfully consolidated ceilings in more than 100 historic buildings in the United States and Canada. The company’s headquarters are in Port Hope\*, Ontario, and North Arlington, New Jersey.

\*The HPCS Canadian headquarters have subsequently moved to Ottawa, Ontario.

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