



## James J. Hill House

ST. PAUL, MN

James J. Hill was a railroad executive who was a pivotal force in the transformation of the Northwest, earning the name "The Empire Builder." When it was completed in 1891, the Hill House mansion was the largest and most expensive home in Minnesota.

Our conservators carried out laser cleaning and other cleaning mock-ups on-site at the Hill House. The purpose of this work was to determine best methods and materials for removing soiling and multiple types of staining on the building's exterior sandstone. This was completed in conjunction with preliminary mosaic flooring removal tests to help develop the waterproofing upgrades for the exterior verandas.

The test locations on-site were selected based on identified conditions from the Consultants/Architects, Miller Dunwiddie (MD), in conjunction with the team from Advanced Masonry Restoration (AMR). Laser cleaning mock-ups took place on multiple locations on the South and East elevations. Mosaic removal mockups included one small area of each of the three veranda floors on the South elevation. Our team conducted multiple laser cleaning tests to remove a variety of types of soiling from the exterior sandstone. It was discussed on-site that the expected level of cleanliness should be to remove or reduce the contaminants from the stone surface to improve its water vapor permeability and to remove the unsightly manganese staining. EAA used a 100w 1064nm Nd:YAG laser unit. Testing included cleaning of copper staining, ferrous staining, manganese staining, tar overrun, atmospheric soiling, and biological growth. Testing also included the use of the laser in combination with AMR's other chemical cleaning procedures. AMR did several tests using chemical cleaners for removing atmospheric soiling and manganese staining.

MORE INFORMATION:

<https://evergreene.com/projects/james-j-hill-house/>

### SERVICES PERFORMED

Investigation, Testing & Analysis  
Laser Cleaning

### PROJECT DETAILS

**Client**

Advance Masonry Restoration

**Architect**

Miller Dunwiddie



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