PROJECT PROFILE

Taft Museum of Art

Vibration Control during Adjacent and Internal Construction | Cincinnati, OH

The Taft Museum of Art retained WJE as vibration control expert to assist with protection of its collections during adjacent and internal construction projects. Adjacent construction included a large highway and tunnel construction project across the street from the museum. Internal construction included renovation of the building's exterior envelope, selected interior spaces, and mechanical systems in the building's attic. WJE performed vibration testing and developed guidance regarding construction works to assist in safeguarding the collection.

CLIENT

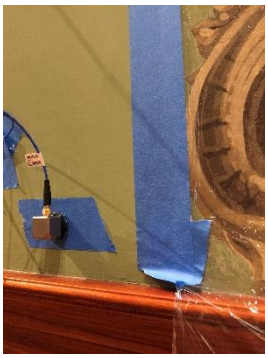
Taft Museum of Art

BACKGROUND

The Taft Museum of Art—previously home to Charles Phelps Taft and Anna Sinton Taft—opened in 1932. Its historic house, built circa 1820, is Cincinnati's oldest remaining wooden residence. The Taft's wide-ranging collection includes murals painted circa 1850 on the horsehair plaster walls by Robert Duncanson, the first African-American artist to achieve international acclaim.

In 2015—2017, the Ohio Department of Transportation undertook a large highway construction project adjacent to the Taft. In 2021—2023, the Taft completed its bicentennial renovation, including building envelope restoration, HVAC system replacement, and other remodeling.

Protecting the museum's collections from the vibrations caused by the construction was of paramount importance.



SOLUTION

In advance of the adjacent highway construction project, WJE performed vibration monitoring within the mural gallery to determine background levels, reviewed highway design documents to understand the planned construction, and estimated transmitted vibration levels. We then developed vibration control guidance that was included in the bidding documents for the project and performed vibration monitoring throughout the vibration-causing construction work.

Before construction to the museum building itself, we performed extensive vibration testing in and around the mural gallery to estimate potential vibration levels at the murals. We conducted mock construction activities in the mural gallery, in the attic above the mural gallery, and at exterior walls adjacent to the mural gallery to measure vibrations at the boundaries of the murals. Using that data, we developed a vibration control specification and contractor guidance document. During construction, we monitored vibrations around the murals, as well as strain in the plaster finishes across the murals, using a custom system of accelerometers and strain gages. The system provided immediate notifications of any above-threshold levels throughout the construction.

Our vibration control services provided reliable information for advance planning by the Taft and accurate bidding by contractors, as well as real-time protection of the collection throughout the construction projects.

WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS