WJE

Project profile Portland Art Museum

Vibration Control during Museum Expansion | Portland, OR



CLIENT Portland Art Museum

BACKGROUND

Founded in 1892, the Portland Art Museum is the oldest art museum in the Pacific Northwest. The museum opened at its current location in 1932 and now boasts a collection of 50,000 objects.

Planning began in 2012 for a major campus renovation and expansion project, and construction spanned from 2023 to 2025. The project adds 100,000 square feet of new or upgraded public and gallery space, including a new entrance, public plaza, café and gift shop, and glass pavilion that seamlessly connects the two separate historic buildings. The museum remained open throughout the construction.

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



The Portland Art Museum retained WJE as vibration control expert to develop guidance for protection of its collections during the renovation and expansion. Construction work generated significant ground- and structure-borne vibrations close to art collection areas. This included heavy demolition of building elements where the construction invaded the existing building footprint at the new loading dock and at both sides of the new glass pavilion. Areas closest to the new work included active art galleries and art storage rooms with an array of collection types.





SOLUTION

Using a vibration control methodology developed and refined through work on dozens of museum projects, WJE vibration engineers performed work in three stages: before, at the start of, and during construction. To accommodate the tight construction schedule, the first two stages were consolidated by leveraging the contractor's equipment on site.

Before construction, we conducted vibration testing by instrumenting the collection areas with arrays of vibration sensors while the contractor performed controlled trial activities with selected vibratory equipment. Data were used to develop detailed vibration control and monitoring plans for each phase, including stand-off distances for critical equipment and minimum requirements and guidance to mitigate vibration transmission.

At the start of construction, vibration trials were conducted to verify vibration transmission for equipment not tested earlier. During construction, vibration monitoring was performed along "safe lines" between the construction and art collection areas. Monitors were programmed to send notifications of any above-threshold vibrations alerting the contractor to halt work, quickly review the data, and change methods, if appropriate, before construction resumed..

Our expert execution of vibration control allowed for facility usage planning by the museum and unencumbered construction progress.