

# Harvard University Art Museums

Complete	Area	Client	Architect
2014	North America	Harvard University	Renzo Piano Design Workshop Payette Associates

Harvard Art Museums is a leading centre for research and teaching in visual arts, dedicated to furthering education at Harvard University in Cambridge, Massachusetts. It is comprised of three separate museums – the Fogg Museum, Busch-Reisinger Museum and the Arthur M. Sackler Museum – which, as part of this project, united their collections under one roof for the first time in their more than 100 year history.

During the renovation the design of the historically registered original building was carefully preserved, while a newer extension was replaced to add considerable extra exhibition space and art restoration laboratories. Building services were completely modernised, incorporating a range of sustainable design solutions, which helped the building gain the LEED Gold Certification.



## Services provided

Sandy Brown's full acoustic service included extensive surveys and measurements of the conditions prior to renovation and delivering informal tutorials on noise and acoustics for the key decision makers with the museums. Assessment, advice and specification were provided for:

- sound insulation
- room acoustics
- environmental noise
- building services noise.

Detailed computer modelling was used to determine the effects of the changes proposed to the building's internal courtyard.

## Special acoustic features

The museum has an internal enclosed courtyard, which is used extensively for events. As part of the renovation the glass ceiling in this area was removed and a larger metal and glass structure, referred to by the architect as The Machine, was installed over the top. Considerable spatial volume was added with this change and there were concerns this would increase the reverberation time and have a negative effect on the suitability of the space for music performance or speech events. Further complicating the issue was the listed status of the lower areas of the courtyard that were to remain.

Using measurements of the reverberation time in the courtyard before work commenced, we created detailed computer models to predict the acoustic performance of the new design. This process involved modelling both the original and new designs so that the results could be compared. The models were able to demonstrate that the new designs were, in fact, favourable for some of the intended uses of space. We then developed strategies and designs for items that could be added to the space on an as needed basis to allow it to have more suitable acoustics for the other intended uses.

Another key room in the renovation was a large lecture space that also needed to be suitable for cinema use. When costs prohibited the implementation of a clever louvre design to vary the sound absorption on the side walls, we developed a wood slat system with the architect that had varied width slots to optimise the sound absorption for suitable acoustics for both lecture and cinema use.

The emergency generator provided to keep the crucial, art preserving, mechanical services systems running during power outages required special care to keep its noise under control, as it was located near a key lecture space and also had to achieve very strict local criteria for external noise egress applicable during its periodic testing. This was accomplished by forming an intricate and intertwining supply and exhaust plenum path that maximised the attenuation of the generator's noise.