



Conserving a Concrete Masterpiece

– *The Getty Foundation assists Sydney Opera House to conserve the World Heritage-listed building for future generations* –

Sydney - Tuesday, 6 September 2016. The Sydney Opera House will trial an innovative new tool with the potential to transform conservation of the one million white tiles on its famous sails.

Every five years, skilled inspection engineers abseil the Opera House to “tap test” the tiles, which are fixed to concrete lids on the sails, checking for changes in the sound or appearance of the tiles.

Sydney Opera House, as part of the Getty Foundation’s international Keeping It Modern grant program, collaborated with University of Sydney and Arup to explore ways to improve the consistency and range of data collected in the tap tests of the sails.

University of Sydney researchers have modified the tapping hammer to include a microphone and thermal and force sensors, and developed algorithms that can be applied to the data collected in the tap tests. The researchers will explore the potential to apply robotic technology to this portable tool, a development which could result in the task becoming fully automated within three to five years, leading to a safer and more efficient process of conservation.

The tap test innovations are incorporated into a new Concrete Conservation Strategy to safeguard the World Heritage-listed Sydney Opera House, one of the foremost examples of the use of concrete in 20th century architecture.

Sydney Opera House CEO Louise Herron said: *“The Opera House is a masterpiece of modern architecture, it is incredibly important that we treasure it for future generations. The concrete elements are in generally in very good condition and we want to keep it that way.*

“The Getty Keeping It Modern grant has enabled us to create a really robust system to inspect and test and take actions early to conserve the concrete for future generation. As the Opera House embarks on a Decade of Renewal, this project plays an important part in helping us to preserve our past with the most future-facing technologies.”

The Opera House Concrete Conservation Strategy integrates existing maintenance practices with new technology to become a world leader in the conservation of modern heritage buildings.

Professor Gianluca Ranzi, University of Sydney said: *“The project has provided the next generation of engineers with a real-world opportunity to develop their skills and increase their understanding of heritage-building conservation.*

“The use of advanced technology has provided the basis for the development and prototyping of an effective inspection strategy applicable to twentieth century concrete buildings.”

Located in a harsh marine environment the Opera House requires vigilant maintenance and active conservation practices to ensure its beauty and integrity are safeguarded.



Three primary areas of the Opera House concrete were studied, based on their heritage and structural significance: the Sails structure; the Roof Pedestals; and the Northern Broadwalk under-structure.

Sydney Opera House Director, Building Greg McTaggart said: *“The complexity of the Sydney Opera House structure called for a creative response to its conservation. The timing of the Getty grant aligned with the near-completion of the Opera House’s Conservation Management Plan (4th Edition) and advances in our Building Information Management system. What is unique and innovative about this project is that we will be able to seamlessly integrate heritage policies with the day-to-day management of the building fabric.”*

The Concrete Conservation Strategy includes a digital Repository of Knowledge that contains a collection of oral histories of original workers on the building and detailed, historic information about the concrete. The Getty Foundation grant also funded a plan to share the insights internationally for the benefit of custodians of other buildings facing similar challenges.

Arup Principal, Dr. Marianne Foley said: *“Arup has been working on the Sydney Opera House for almost 60 years, on over 300 individual projects. In our work, we draw on this historical understanding regularly. Our accumulated knowledge is an invaluable resource not only for the Concrete Conservation Strategy, but for the future operation and protection of our nation’s most significant cultural asset.”*

Getty Foundation Director, Deborah Marrow said: *“When Keeping It Modern was launched in 2014, Sydney Opera House was among our 10 original grantees, and we were impressed even then by the team's well-defined goals and enthusiasm for the project. Two years later, it is wonderful to see the result in a comprehensive conservation strategy for one of the world’s most important examples of modern architecture.”*

Senior Program Officer at the Getty Foundation, Antoine Wilmering said: *“The work of the team at Sydney Opera House has significantly raised the bar for architectural conservation and serves as a model for other 20th century buildings that have similar complex concrete conservation concerns,” “The collaboration with the University of Sydney has been extremely fruitful, and has resulted in advanced testing and monitoring techniques that will benefit the opera house and the field for years to come.”*

Sydney Opera House Director, Building Greg McTaggart said: *“The project brief required the outcomes of the project to be adaptable to other sites so this has provided a great opportunity for the Sydney Opera House Concrete Conservation Strategy to benefit building conservation around the world.”*

For more information see: http://www.sydneyoperahouse.com/concrete_conservation.aspx

Images and video content are available for download [here](#)

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Sydney Opera House and The Getty Foundation

Sydney Opera House is a World Heritage listed masterpiece of human creative genius. Recognised as a world class performing arts centre, the building is equally famous for its pioneering use of reinforced and post tensioned concrete as a prominent architectural feature.

In 2014, Sydney Opera House was awarded one of the first of 10 grants under the Getty Foundation's Keeping It Modern initiative, which was established to support the conservation of 20th Century architecture.