

Federation Square - Melbourne, Australia

Essay by Sofia Orozco 10/4/2022

In 1996, the Victorian Government held an international design competition for a civic space along the Yarra River that included both cultural and commercial programs. The design needed to incorporate an open-air space capable of holding 15,000 people, and was to be constructed on top of the city's busiest active railway yard. The project was awarded as a joint partnership with LAB Architecture Studio and Bates Smart and has since become an respected venue for culture, the arts, and public events.

The architectural design was based on the idea that a federation is not one central authority, but rather a league of parts, thus Federation Square is made up of multiple buildings surrounding a large plaza with three "main" buildings. The Atrium is a large public space with fully glazed walls and roof, and contains a glassed amphitheater. The Alfred Deakin Building contains the Australian Centre for the Moving Image (ACMI) and the Special Broadcasting Service (SBS) headquarters. The Ian Potter Center building contains a gallery entirely dedicated to Australian art.

Federation Square sits on top of a deck supported by 3,000 tons of steel beams with an extensive vibration absorbing system composed of both spring isolators and natural rubber bearing isolators. This was needed to ensure that the vibrations of the trains below don't infiltrate the buildings above and affect the quiet museums, cinema spaces, and radio/television studios.

Part of the Architects' design included a large glass atrium that posed the question of how to prevent overheating without overusing an HVAC system. The environmental and energy design consultant, Atelier Ten, suggested the innovative passive cooling solution made of the largest thermal labyrinth in the world. The massive system takes up an area of 40x40 meters and lies above the deck on top of the railway, but under the civic plaza, simultaneously serving as support for the plaza's deck slab. The labyrinth works like a battery where the cooler night air is pumped through the concrete wall maze, cooling down the concrete. During the daytime, the concrete cools the warmer air as it passes through the labyrinth, where it can then be sent up through the floor of the atrium, cooling guests. The air is then warmed by the sun and exits through the atrium roof. The thermal labyrinth effectively uses about one tenth the energy consumption of a traditional air conditioning system.

Easily the most recognizable element of Federation Square is the triangular grid facade clad with sandstone, zinc, and glass, and designed by facade engineering company, Newtecnic. The primary structure of the buildings is reinforced concrete that supports glass

walls. There's then a second exterior layer of a pinwheel tiling pattern supported by steel framing. The geometric facade system allows for each building to have unique characteristics while still feeling untied. The design of Federation Square is controversial among critics, widely because of the facade, but the space has won several awards praising it for its urban design and architecture.

References

"Urban Design:Federation Square, Melbourne." *Archinomy*, 13 Nov. 2019, www.archinomy.com/case-studies/urban-designfederation-square-melbourne/.

"Federation Square." *Atelier Ten*, 31 Aug. 2022, www.atelierten.com/projects/federation-square/.

"Federation Square, Melbourne, Australia - Newtecnic: Engineering and Design." *Newtecnic*, newtecnic.com/federation-square-melbourne-australia.



Additional Pictures

Labyrinth Ventilation

