

BIM Awards Nomination – Sports & Recreation

Project: Sydney Football Stadium

By: DBM Vircon

Products Used: Tekla Structures, Tekla Model Sharing and Trimble Connect

Project in Numbers:

- *AU\$828 million project capex, funded by the NSW State Government*
- *42,500 seat capacity stadium*
- *Over 25,000 shop fabrication drawing*
- *Over 7000 primary steel members*
- *2,300 tonnes of steel*

Description

The new Sydney Football Stadium will be a modern, world-class venue that provides Sydney with a sporting and entertainment precinct of an international standard for decades to come. As such, it's little wonder that the Stadium will be home to the Sydney Football Club, the NSW Waratahs Rugby Union team, and the Sydney Roosters Rugby Club. The New South Wales Government is investing \$830 million in the development of the new 42,500 seat Stadium on the site of the now-demolished Allianz Stadium, which was completed in 1988 as one of Sydney's major bicentennial projects.

The 62,000m² Stadium is part of the broader development of the 8.7-hectare recreation and sports precinct at Moore Park, which encompasses a light rail line, walkways from central station, and revitalised community areas. The project will create new active spaces for patrons and the community, and increase New South Wales' ability to host international, national, and local events.

Demolition of Allianz Stadium commenced in March 2019, with construction of the new Stadium beginning in April 2020. As of July 2021, nearly 1,500 pile foundations have been installed to support the structure, and 200,000 tonnes of earthworks have been completed. The concourse structure is complete, and the structural roof steel is being installed. The Stadium's official opening is scheduled for September 2022, in time to host the NRL Rugby League Grand Final in 2022 and the 2023 FIFA Women's World Cup.

Stadium Design

According to Cox Architecture, the new Stadium design builds on the legacy of the original. Its sweeping roof floats over the seating bowl and will cover all patrons with 100% drip line roof coverage. To achieve this result, the roof structure is shaped in the form of a diagrid net. This is being supported by four corners 'super columns', otherwise known as Derricks. Spanning between the Derricks are inner space Arch Truss frames that measure approximately 140m and 90m in length, connected by large pins. The structural design also includes an outer tension ring and underlying columns which connects and supports the roof to the stadium "bowl" steelwork. A sculptural, ribbon facade draws on elements of technology, engineering and art. Covered in a delicate veil of bronze fins, the façade forms an environmentally responsive skin that enhances patrons' sense of connection to place.

The new Stadium will have substantially improved sightlines—there won't be a bad seat in the house. It will also feature world-class amenities and food and beverage outlets, improved corporate entertainment facilities and greater accessibility.

Environmental Sustainability

The stadium has been designed with environmental sustainability in mind, achieving a US Green Building Council LEED gold rating. For instance, the roof structure was designed to require 40 per cent less steel in its construction when compared to the reference design. The Stadium will feature solar panels and water harvesting systems on its roof, while its carefully designed profile will reduce the building's overall impact on its parkland location.

The new landscape surrounding the Stadium will double the number of trees on the site, creating new habitats for native wildlife. The design of the roof will provide containment of noise, as well as protection from rain and sun for patrons.

DBM Vircon's Scope of Work

DBM Vircon was engaged initially by S&L Steel Fabricators to supply shop detailing services for the stadium roof structure and site temporary works steelwork. This package of works comprised:

- Four 'super columns', otherwise known as Derricks
- Ten Arch truss sections spanning between the 4 x Derricks that measure approximately 140m in length on East and West side and spanning 90m on the North and South side
- Outer Tension Ring steelwork and supporting under columns
- Interconnecting diagrid "net" of CHS steelwork and curved RHS members
- Temporary site works structures including platforms, jacking assemblies, ladders, handrail, and grating

Due to a tight construction schedule, DBM Vircon's scope of works expanded to encompass an early Design Assist stage. This encompassed a period of collaboration with the project Architect (Cox Architecture), Structural engineer (Aurecon), Main contractor (JHG) and Roof Fabricator (S&L Steel) to help fast track connection design and streamline the process from engineering design to detailing to fabrication.





