



Theca Timber and Rubner structure at the Eric Tweedale Stadium in Western Sydney (left) and the Stromlo Leisure Centre in the ACT (above and below).



Better with Wood

Paolo Aschieri explains how using timber as a primary construction material can deliver more sustainable sport and leisure facilities

The Queensland Government's March announcement that the redevelopment of Rockhampton's Browne Park, the home of rugby league in Central Queensland for more than 100 years, would feature a three-level 3,500-seat grandstand with a timber structured roof as the key part of a \$54 million redevelopment of the venue, is confirmation of the growing recognition of using timber as a building material in construction projects.

A key reason for this is that timber is a renewable resource, and using it as a building material can help to reduce the environmental impact of construction projects. Additionally, advances in engineered wood products have made timber a more viable option for larger and more complex construction projects, including aquatic, entertainment, recreation and sporting venues.

In terms of returns on investment, using timber in sport venue construction can offer a number of benefits. For example, timber construction can be faster and more efficient than traditional building methods, which can help to reduce construction costs. Timber can also offer excellent thermal performance, which can help to reduce energy costs associated with heating and cooling the venue.

Moreover, the use of timber in sport venue construction can create a unique and visually appealing aesthetic, which can help to attract users, fans and members and, by enhancing their experience, can potentially lead to increased income.

Background

Timber has been used as a building material for thousands of years, dating back to ancient civilisations such as the Egyptians, Greeks and Romans while in Europe during the Middle Ages, timber framing became the dominant form of construction for buildings such as churches, barns, and homes.

The use of timber allowed for the creation of large, open spaces and provided flexibility in design with construction aided by carpenters developing intricate jointing and joining techniques to create strong and durable structures.

Through many centuries, timber has played an important role in the construction practices of Indigenous Australians. Prior to the arrival of Europeans, Indigenous peoples across the continent used timber to construct shelters, hunting and fishing tools, and various other implements.

Moving to the present, there has been a renewed interest in timber construction in the current millennium, particularly in the form of engineered timber products such as glulam (glued laminated timber - GLT), LVL (laminated veneer lumber) and CLT (cross-laminated timber). These products, along with new processes and techniques, allow for the construction of larger and taller timber buildings than previously possible and have gained popularity for their environmental sustainability, renewable nature, full prefabrication (making installation on site easier, safer and cheaper) and aesthetic appeal.



The Stromlo Leisure Centre in the ACT (above and below).



The Eric Tweedale Stadium in Western Sydney (above and below).

Perhaps the most high profile timber sporting project globally is the planned Eco Park in the UK, set to be the new home of English Football League side Forest Green Rovers FC.

While construction has yet to commence, plans for the 5,000-seat stadium show a venue that will be built almost entirely from wood - including its overhanging roof, structure and cladding.

However, Australia already has some significant examples of timber construction in sport and leisure facilities in use or approaching completion.

Stromlo Leisure Centre, ACT

Nestled below the Mt Stromlo Observatory on a landmark site within Stromlo Forest Park, the Stromlo Leisure Centre (SLC) was commissioned by the ACT Government to serve the rapidly growing community of Molonglo.

Completed in 2019, the \$36 million SLC's facilities include an eight-lane 50-metre lap and competition pool, 20 metre learn to swim pool, waterslides, a toddler's pool and splash park, gym and fitness studio, a café, creche and swim store.

Key to the Centre's design was its connection to its local environment, both through physically grounding the project in the foothills of Mt Stromlo, and through selecting materials that relate to the surrounding bushland.

The building's construction was one of Australia's first long spanning mass timber construction examples, which Ian Smith, Director of Cox Architecture, advised incorporated "construction techniques that have been practiced in Europe for centuries."

The use of structural glulam timber beams, struts and purlins for the main roof over the pool concourse by builder Kane Constructions was locally engineered in Australia, then manufactured in Europe and imported - with a lead time of roughly 10 months from design to arrival onsite.

Smith went on to explain "selected for its natural feel, glulam timber relates to the building's context, with its warm earthy

glow softening and complementing the interior materials palette and making the space more human and welcoming.

"The glulam struts are clustered, reaching up in intervals around the perimeter of the main concourse like tree branches, supporting the beams as they span across the volume.

Both the beams and struts taper, allowing the structure to read more finely, and the space to read more fluid and open.

"Not only beautiful, glulam is durable and easily maintained, making it an appropriate material choice for this corrosive environment. The use of this product was both an innovative and sustainable design choice. Due to the scale of the forest where the timber was harvested, the 250 cubic metres of timber used at SLC took only 10 minutes to grow."

Eric Tweedale Stadium, Granville, NSW

Completed in 2021 and going on to win that year's Australian Timber Design Award, the Eric Tweedale Stadium offers a new home for community sport and is home to the Two Blues Rugby Union Club. The Stadium has been a benchmark for sustainable construction in terms of cost effectiveness, efficiency, design quality and sustainability.

Designed by dwp | design worldwide partnership, the \$11.3 million project also won in the category of 'Commercial and Public Buildings' as well as Excellence in Engineering.

With seating for 750 spectators as well as a function/events space, it features a glulam roof that cantilevers eight metres over the seating.

Commenting on the project, dwp | design Director, Ivana Simkovic stated "environmental sustainability was an important objective of the project and timber construction was key to achieving this.

"The use of a mass timber structure in the Stadium is the first use of glulam timber for this type of facility in Australia and represents an impressive achievement and benchmark in timber engineering."





Theca Timber and Rubner structure at the Bay Pavilions arts and aquatic centre in Batemans Bay (above) and at the Marrickville Library in NSW (below).

Bay Pavilions arts and aquatic centre, Batemans Bay, NSW

Inspired by its stunning natural landscape setting and featuring an organic design language that makes extensive use of sustainably sourced timber, Bay Pavilions combines an aquatic and recreation precinct with a theatre and arts venue.

Structural glue laminated timber has been utilised throughout the aquatic pavilion and foyer spaces to provide a sustainable and durable structure that connects people to place. Not only does the timber create a wonderful connection to nature but it is also a highly suitable material in the harsh indoor aquatic environment.

The timber for this project was engineered in Australia and sourced from sustainably managed spruce forests in Europe. The 167 cubic meters of glulam used in this project is regenerated in the equivalent of every five minutes and has locked away 127 tonnes of CO2 stored in the timber providing a sustainable structure with a great aesthetic outcome.



Rubner construction in the Technogym Village, the global wellness leader's Italian base.

Northcote Aquatic and Recreation Centre, Victoria

Aiming to achieve both low operating costs and 6 Green Star certification from the Green Building Council of Australia with its soon-to-open Northcote Aquatic and Recreation Centre, the City of Darebin made sure materials used in construction minimised the carbon footprint of the construction while also increasing durability.

As a result, a light-weight timber structure - which once completed will be the largest under roof mass-timber pool in Australia, and the first in Victoria - was chosen for the building - reducing embodied carbon while offering a natural aesthetic.

Janine Parker, Darebin City Council's Environmentally Sustainable Developments Officer, explains "as buildings become more energy efficient operationally, the embodied energy of the construction materials becomes a much larger piece of the carbon footprint. This whole-of-life quantification is incredibly important to truly assess a building's impact on the climate."

Other projects

Other significant projects include the completed Marrickville Library in NSW, Chadstone Link in Melbourne and the Macquarie University Law School Building, NSW.

Soon to be completed and upcoming projects include the St Aidan's Sport Hall in Brisbane, the Tumbalong Green Stage upgrade at Sydney's Darling Harbour, the new Sydney Fish Market and the Oran Park Leisure Centre in NSW.

Conclusion

With timber construction having a long heritage in the building industry, its use continues to evolve and adapt to modern needs and trends offering a range of benefits and representing a good investment for those developing sport and leisure facilities.

In fact, it is no longer the question of whether or not timber can be used in visionary construction projects. The question is rather how to best use it.

Paolo Aschieri is a Director of Theca Timber

Theca Timber and Rubner

As the representative partner for Rubner in Australia and New Zealand, Theca Timber is a go-to expert in engineered timber structural solutions, and a major supplier of all kinds of engineered timber structures in both countries.

Rubner started manufacturing glued laminated timber (GLT) in 1976, and today it's an innovative product-oriented manufacturer with headquarters in Italy, branches across Europe, and has completed jobs in over 60 countries.

Being a specialised company in timber engineering, Rubner is conscious of the strong impact of the early involvement of an engineered timber manufacturer in the design process, and can lead projects using timber where it is called for. It's one of the world's largest bespoke GLT supplier, well known for its versatility and fully prefabricated solutions.

Representing the natural evolution of expertise in timber construction, since 2016 Theca Timber and Rubner have joined forces to offer services that range from managing the design process completely, to offering specialist consultancy for complex structural solutions, to supply fully prefabricated structures straight to site.

While promoting and marketing innovative solutions to the entire local industry - including developers, architects, engineers, specialist consultants and builders - Theca Timber and Rubner make sure that right from the start of the design for manufacture and assembly (DfMA), the process progresses to create cost efficiencies in value engineering.



Eric Tweeddale Stadium, Cumberland, Sydney - the first project in Australia, where glued laminated timber is being used for the construction of a sports stadium instead of steel and concrete.



We live timber engineering.

Offsite manufacture for
quicker installations on site

Economic savings &
budget certainty

Longevity & carbon neutral

Aesthetic & biophilic
designs

For the construction of the stadium 183 m³ glued laminated timber was used. This saved 109 tons of stored CO₂.

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