

## A TIMBER CROWN FOR THE BEST NEW RESIDENTIAL BUILDING IN BRISBANE

### THECA TIMBER PRESS RELEASE

**Building: Upper House**

**Location: 66 Hope st, South Brisbane (QLD)**

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#### 1. Job's Information

Upper House is a breath-taking new residential tower in South Brisbane, designed by **Koichi Takada Architects** and inspired by the forms of the Daintree Rainforest. It's set to become a new benchmark in luxury apartments in the city, featuring Australia's first double-storey rooftop club.

The fluid sculptural 'ribbons' of the building set it apart in the streetscape and wind their way up the facade in reference to the roots of the Moreton Bay fig tree native to Queensland. At roof level, the ribbons twist and intertwine to become a shaded pergola for the generously proportioned recreational spaces.

**Aria Property Group**, the Developer of Upper House, is a visionary residential developer originally from Brisbane, with an outstanding record of breathtaking new buildings in the city. They wanted to create not just a new home for many, but an iconic tower in the skyline of South Brisbane, an eco-sustainable 5 stars Green Star rated building, and a luxury community space for residents to indulge in a new, healthy and comfortable lifestyle.

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The 122mt tall tower, featuring 34 storeys of which level 32 and 33 are offering a Wellness Club for a fully integrated approach to health, fitness and general wellbeing; and the Roof Top Club features resident's wine bar and cellar, resident's lounge, private dining room, private theatre, home office and executive boardroom for residential units. The building has 188 luxury 2 and 3 bedroom apartments, and penthouses.

The General Contractor of Upper House, called **Minicon**, operates autonomously and with independence whilst benefiting from the expertise, financial capacity and corporate strength afforded by a Group of Companies, mainly composed by Icon Construction and Kajima Australia. The group of experienced, yet young professionals that delivered such an reference to their jobs portfolio, was able to navigate the construction site through Covid, labor shortages and floods, among other challenges.

## **2. Theca Timber Scope of Work**

Theca Timber was involved from the very early beginning, participating in the tender hand-in-hand with Minicon and consulting on the most cost-efficient way to build what, before then, was a concept design. The continuous interaction and collaboration with Koichi Takada Architects resulted in a Siberian Larch glulam pergola made of slim, load-bearing main ribs, featuring double- and triple-bent elements fabricated with a 3D special technology from specialised European Partners, and over 1,6 km of timber purlins for shading.

The supply of the entire pergola, fitted with steel connections right from the factory to accommodate a smooth and easy lifting and assembly process, and the delivery to site following a just-in-time sequence was key for Minicon to contract the job to Theca Timber.

Further to the above, Theca Timber was awarded the design and supply to site of two 9mt tall unique structures, called The Nests. Positioned at the 32nd floor of the tower, The Nests are timber rounded platforms forming a suspended parlour on top of the pool area, surrounded by an intricated freeform mesh of Ash Tree timber providing shelter and privacy. Due to the intricacies in the assembly of bespoke, unique elements, Theca Timber was requested to provide full technical supervision of the assembly, right from the start.

## **3. The Pergola Production and Sustainable info**

The Pergola is made of Larch, one of the most durable species in the world, commercially viable for its sustainable chain of custody (PEFC), used for free-

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form structures due to its ductility (larch is a softwood) and uniformity of structural performances even when weather exposed.

In total the Pergola is made of 48m<sup>3</sup> of timber, with a net carbon storage of about 46 tons of CO<sub>2</sub>, roughly equal to the greenhouse gas emissions of 2 Australian per year, the combustion of 118 barrels of oil, or truck transport over 52790 ton-kilometre.

The Pergola was manufactured using a true international network of specialised Suppliers spread across Italy, Germany and Austria. It is made of 672 individual timber elements and over 1.000 units of steel brackets and connectors, CNC cut with millimetre prevision by robotized machines working with tri-dimensional production files. Most of the elements have been factory fitted with the steel hardware to allow for a quick and inexpensive installation on site. The DfMA (Design for Manufacturing and Assembly) process took over 6 months, involving around 10 people in between Structural Engineers and Specialised 3D Draftsmen.

The Pergola is a world first. In fact, timber elements are bent tri-dimensionally, but not just using straight lines to form shapes, but twisting the elements in the space. The challenge in designing it for production was probably the hardest of all.

The 40-years design life of the pergola is achieved not just through a proper structural design and by using the appropriate timber species, but also sorting the protection coating system with a specialised supplier, and stipulating a regular maintenance process accepted by Aria Property Group.

## **4. The Nests Production and Sustainable info**

The Nests are two structures about the same size, which ribs and circular bench made of Ash Tree timber, where coordinated in a holistic design process with the supporting column, the structural internal disk and the bridge connecting the disk to the slab at level 32.

Ash tree (scientific name Fraxinus) is a hardwood which growth is extensive in Europe, Asia and North America. It is well known to be a tough and very strong wood, but elastic. It is commonly known for making electric guitars for possessing tonal properties, but stiff enough to hold the impact that the bodies of the guitars should guarantee.

Each Nest is composed of 92 ribs, split equally in half for the top and the bottom part, connecting at the disk using a concealed, pre-assembled hardware. They have been designed using Rhino, and just a handful of them are copies of

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another rib, while the majority are uniquely designed. The ribs have been steamed using an innovative process which included the design and construction of a dedicated steaming machine and a number of hydro-adjustable moulds to be able to form the shape that each rib was designed for.

The bench is de-mountable and, while each individual piece has been manufactured by a robotised machine, the finish and final touch has been given to a specialised artisan working in the Italian factory prior shipment.

## **5. Timeline**

Together with the group of relevant consultants involved in various aspects of the design of both The Pergola and The Nests, Theca Timber started the design in January 2021.

The Pergola 3D model was completed in October 2021, requesting over 1.200 hours of structural analysis and modelling. The Design was then developed into shop drawings and fabrication drawings within the following months, hitting production in February 2022.

The Pergola was delivered at various stages from June to August of the same year, and it was finally installed starting January 2023.

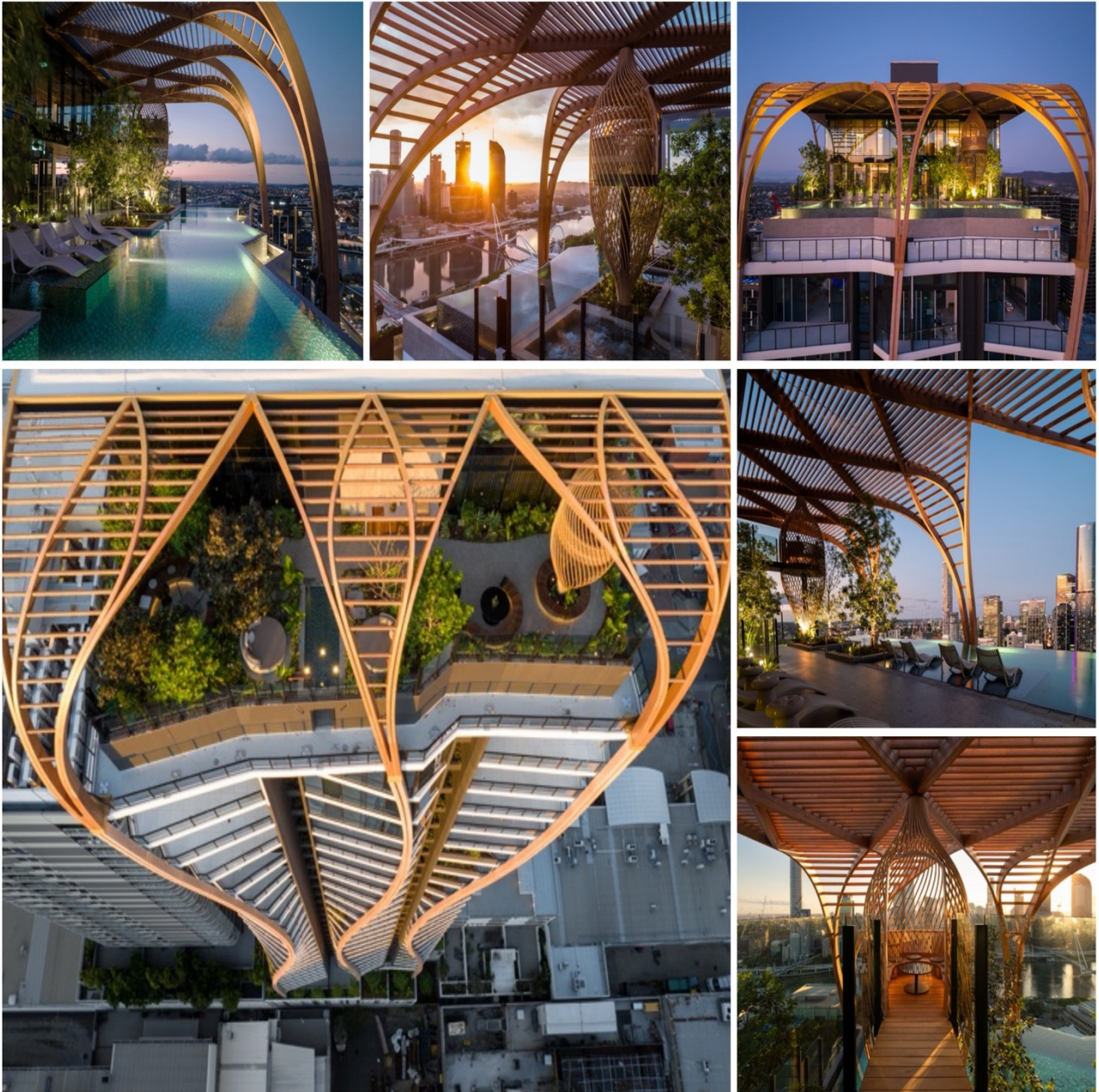
The Nests design was completed in about the same time of The Pergola, but the man craft and the uniqueness of the fabrication process requested to shape the ribs pushed the fabrication only at a never seen 9-months time. Due to the high-end of prefabrication and the accuracy in the tollerances, the installation lasted 2 weeks only during the month of April 2023.

## **6. Practical completion**

With the exclusion of the penthouses levels, Upper House reached practical completion in October 2023 and Theca inspected the timber structures together with all relevant parties, and released the Operation and Maintenance Manual agreed with Aria Property Group.

The following pictures are representative of the amazing work done by everyone involved in achieving an iconic structure, unique to Australia and very relevant to the world of timber structures.

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## 7. Declarations

Koichi Takada (Architect): *“Wood itself is a living material. It shrinks and expand. Lot of curves, part twists. With timber it is possible, while with other materials it would be hard to. A wonderful cooperation with Minicon and Theca, good coordination and exchange of information, but most important was the*

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*confidence within the team that took a long time to be achieved and it was key to such a great outcome”.*

*Giulia Licastro (ARIA): “As ARIA’s most sustainable project it was vitally important that we supported and embraced the use of natural materials on our project. The Upper House timber pergola is a bold and memorising structure which encapsulates ARIA’s and Australia’s first double height private residential rooftop. Overcoming the challenges of curvature, scale, height, and a vision to span the structure unsupported over 3 stories required completed symbiosis between developer, architect, engineer, manufacturer, head-contractor, and the delivery team. This structure will continue to astonish people from across the world for decades to come along with the lucky individuals that get to call this project home”.*

*Josh Woolnough (Minicon): “681 individual timber elements, 40 dowels that connect each of the main base elements to the concrete slab, every element unique and prepared for millimetre tolerance on site. Nothing is stock standard in the pergola, which made us to think out of the box from the very early beginning and through the installation procedure too. It’s a gigantic Meccano set and you must be in full control of all details right from the start”.*

*Paolo Aschieri (Theca Timber): “Our Engineers partners did a great job on the Upper House pergola proving they’re the best in the world. And the Designers made it possible with a great attention to the details. Out of the 460 steel brackets connecting the main to secondary elements, there is not one that is copy paste to the other. The level of accuracy, and commitment by everyone across the supply line, is unbelievable. We pushed the boundaries of what the technology of engineered timber had done before in Australia, creating a unique structure that marks a clear precedent in the market”.*

## **8. Contacts**

For more information, please contact Paolo Aschieri at [paolo@theca.com.au](mailto:paolo@theca.com.au).