

A WORLD-CLASS CENTRE FOR THE ARTS

DEVELOPER : Whitehorse City Council
MAIN CONSTRUCTION COMPANY : Kane Constructions
ARCHITECT : BKK Architects and Kerstin Thompson Architects
CONSTRUCTION CONSULTANT: Rider Levett Bucknall
ENGINEERING CONSULTANT: WSP
CONSTRUCTION VALUE : \$56 million



The Whitehorse Performing Arts Centre Redevelopment – ‘The Round’ manifests the best practice for environmentally sustainable design initiatives. The development features a 626-seat proscenium theatre, a 203-seat studio theatre black box, two rehearsal studios and improved soundshell for outdoor events.

Multi-award-winning, privately owned commercial construction company Kane Constructions was awarded the redevelopment of the Whitehorse Performing Arts Centre, named The Round.

“We here at Kane are thrilled and privileged to lead this challenging yet highly rewarding project for the Whitehorse City Council and its community. The redevelopment of the Whitehorse Performing Arts Centre is designed to bring community benefits for future generations to come,” said Contract Manager for Kane Constructions, Art Dejmance.

“Once completed, the centre will serve as a contemporary state-of-the-art performance and events facility as well as a community-orientated hub for artists, performers and patrons and a diverse range of local business and community groups.”

The centre will also host a bespoke main foyer with a bar, sound shells suitable for outdoor concerts and community festivals, a multipurpose rehearsal/dance studio, a community meeting room, a multiuse function room and upgraded car parking. The carpark upgrade will enable quick and convenient access to the Whitehorse performing arts centre, library, council offices, local parkland and nearby Walker Park sports precinct.

The redevelopment is projected to generate over 320 new jobs throughout the construction phase and beyond. Work began in November 2021 with 10 Kane staff and 80-130 contractors onsite throughout the project.

The staging of the building permits enabled Kane to begin work onsite while finalising the remainder of the design. Kane’s prior experience

with theatres has helped the team with the knowledge to problem-solve complex project elements, such as the theatre rigging system in the fly tower.

“There are a lot of technical complexities that come with the design and creation of a bespoke theatre that sits at the heart of an architecturally complex building. A key feature of the build are the acoustic airlock entries to the theatres specifically designed to minimise the level of sound that can escape from the space. These play a vital role in the acoustics of the space, which in a theatre setting is invaluable to the performance space quality and usability,” said Art.

“However, the most complex element of this project is the roof. The design of the roof is scallop shaped and presents a challenge structurally and architecturally and has a flow-on effect to the likes of the external façades and internal air tightness.”

Celebrating local designers and locally sourced products was a focus for Kane on this project, as was environmental sustainability. Environmentally sustainable design elements and products have been used, reused and recycled across the project and its stages.

This includes air tightness testing, efficient thermal systems, rainwater harvesting, energy-efficient plant and equipment to reduce greenhouse gas emissions, use of low carbon and durable building materials, LED lighting, landscape treatments, water-efficient fixtures and fittings and double-glazed windows.

“Despite the project being very complex structurally and architecturally, the real challenges came from industry-wide material and labour shortages. However, through careful planning and collaboration with key stakeholders, consultants, trades and subcontractors, the project is still set to complete on time,” said Art.

Kane Constructions is a two-time national master builder of the year commercial construction company active in all industry sectors. Kane Constructions commenced operations in Melbourne in 1973, and are celebrating 50 years in the construction industry this year. The company operates throughout the east coast of Australia from offices in Melbourne, Sydney, Brisbane, Sunshine Coast and Canberra.

For more information contact Kane Constructions, phone 03 8420 1200, email viccontact@kane.com.au, website www.kane.com.au



STEEL BUILT TO INSPIRE MAKING THE COMPLEX SIMPLE

State-of-the-art buildings like the **Whitehorse Performing Arts Centre** require innovative solutions to achieve a quality, high-standard build. To achieve the complex shapes required by the design, CMG Frames were contracted to provide their framing solution expertise to the project.

“We created pre-designed ACCUCurve panels that allow the lightweight brick façade system to be pre-laid onto the frames off site and installed as a pre-cladded frame,” said National Business Development Manager, Dan Thomson. “This achieves a more efficient and cost-effective installation of the frames and brickwork without the need for scaffolding which affects other contractor’s access to the building façade. It’s an industry leading approach to Architectural curves.”

CMG Frames’ company directors have extensive cladding design and installation experience which enables the company to create and offer framing solutions that are not only effective and aesthetically pleasing but are also innovative and allows for streamlining of processes for trades who work on and with the frames.

“This insight into the cladding process, challenges, and costs, means that we can create specifically designed solutions to create a better product with tangible time and cost-saving benefits,” said Dan.

To execute the idea of pre-cladding the frames without them becoming too heavy to install, CMG Frames were contracted because they are specialists in using recommended light-gauge steel that weighs

just 1kg per lineal metre, instead of the originally planned heavy structural steel. The team utilised Australian-produced TRUECORE steel, known in the industry for its superior quality and 50-year product warranty.

“This build was a large-scale, complex project with two curved façades. It required custom curved frames, specifically designed brackets and shop drawings. Our team engineered those curved frames utilising our state-of-the-art lasercut profiled track to cut the exact radius of the curve in the steel which guarantees the accuracy of the architectural design,” said Dan.

CMG Frames used approximately 23 tonne, 22,000.00 lineal meters of light gauge steel framing in this project.

The team first created a 3D model of the entire building façade, identified the connection points and began to calculate the frame sizes needed and the individual engineering specs to meet the requirements for each frame.

“A challenge that presented on this project came when the building drawings changed due to adjustments of window sizes. This became an opportunity for us to re-adjust the size of the effected frames and the bracket positionings to accommodate the changes. Being a full solution provider allows us to be agile when faced with changes and to swiftly make these adjustments without major delays or disruptions,” said Dan.

The frames were all designed, engineered and manufactured inhouse at the CMG Frames manufacturing facilities, in Sunshine

West, Victoria. From the creation through to the delivery of the panels, 20 staff from various departments worked on the frames.

The team delivered 162 panels approximately 4m x 6m in size, in three stages to align with construction phases; delivering the eastern aspect panels in November 2022, followed by the western aspect panels, with the final set of southern aspect panels delivered in early March 2023.

CMG Frames in Melbourne, offers steel framing for the commercial construction industry, using a fusion of design, engineering and manufacturing. “Our passion is using steel to create exciting, inspiring and durable architecture for construction across Melbourne and Victoria,” said Dan.

The company deliver prefabricated steel products including the design and manufacturing of prefabricated lightweight steel frames including wall frames, floor joists and roof trusses from their modern manufacturing facility using 3D design software packages, and state-of-the-art automated roll-forming frame machinery.

Upcoming projects include the design and fabrication of façade frames and roof trusses for a large-scale, five building, mixed-use public housing project in Brighton and façade frames to be installed on a cross-laminate timber structure for a carbon-offset project in Xavier College in Kew.

For more information contact CMG Frames, 32 Industrial Drive, Sunshine West VIC 3020, phone 03 9310 1413, email info@cmgframes.com.au, website www.cmgframes.com.au



A CURTAIN RAISING PERFORMANCE

Major Cranes have been the Melbourne Metro experts in crane hire, dogging and rigging since 2012. The company was contracted to handle the installation of concrete structures and precast elements with the provision of mobile cranes, labour hire and a transportation for the Whitehorse Performing Arts Centre project.

“We were onsite with three of our team members for the precast element of the project and between 5-8 staff for the cladding side of the job over seven months in mid to late 2022,” said Major Cranes Precast Manager, Joel Ruru.

“For this project, we had onsite a 130-tonne, 160-tonne, 220 tonne and 250-tonne mobile crane, a 15-tonne Franna crane, crawler cranes for installing the cladding, various EWP’s and a semi with a long trailer to transport the cladding from the factory to site,” said Joel.

“The most complex element of this installation for us was the walls that needed to be stacked one on top of the other without a floor slab due to the shape and height of the building, which features theatres with high ceilings,” said Joel. “This is not commonly done, but with careful planning, additional steel tie-ins and collaborating with the other trades involved, we were able to achieve a structurally solid and visually pleasing result.”

Major Cranes the specialists in precast installation, mobile and tower crane equipment and labour hire. Founded by Melbourne construction industry veterans, the team brings decades of knowledge and expertise to every project and work with builders, construction firms and developers to deliver exceptional service and equipment hire for commercial, civil and domestic projects.

Recently completed projects include Monash Medical Centre car park and Northern Private Hospital.

For more information contact Major Crane Logistics, 152 Jersey Drive, Epping VIC 3076, phone 03 7002 4319, email info@mclogistics.com.au, website www.crdambra.wixsite.com/mclogistics



SETTING THE STAGE

D&C Consultants Australia were contracted to develop the overall erection design and installation of the basement, theatre and flytower structures, ensuring the heart of Whitehorse Performing Arts Centre was structurally sound.

This included the design and detail of temporary works, sequencing and methodology for the precast panels, the theatre and flytower internal steel structures, which three staff completed over 15 months, and involved attending site for inspections regularly throughout the build.

“We provided design sketches and work method statement documents required for this install, in addition to leading procedure workshops, advised on temporary work removal and conducted frequent site inspections throughout the build,” said D&C Consultants Director and Project Manager, Lisa McGowan.

The installation of the flytower precast panels was the most challenging aspect of this project. Lisa said, “The flytower structure is a concrete box structure that sits above the main theatre level with no surrounding or internal slabs. This means there were no supporting slabs that the precast panels could be temporarily braced to during the construction stage, which would be standard practice. So, we designed and detailed an installation concept to secure the flytower panels to an internal birdcage scaffold using three external core structures for stability.”

D&C Consultants Australia are a structural engineering consulting company specialising in precast and prestressed concrete design and installation across Victoria. “We’re passionate about providing solutions for complex builds,” said Lisa.

Recently completed works include the erection design for the precast, steel and feature timber roof structures at the Northcote Aquatic Centre. D&C are also involved with several precast slab design projects across Victoria, examples of completed projects include the AirTrunk data centre buildings in Derrimut and the M-City Development in Clayton. These projects involve the in-service design of the slabs and the construction stage design and methodology.

D&C work closely with Westkon Precast, providing in-service and installation design for their precast structures, as well as engineering for factory related works e.g. precast storage, concrete moulds, precast transportation.

For more information contact D&C Consultants Australia, 528A Ballarat Road, Albion VIC 3020, phone 0420 861 300, email lisa.mcgowan@dcconsultants.com.au



AIRTIGHT & EFFICIENT

Airtightness is centred around creating healthier indoor environments with improved air quality and comfort levels, enabling significant energy savings and increasing building longevity.

Efficiency Matrix contract to builders and architects to conduct various design reviews and air tightness testing on buildings. They offer recommendations on the air barrier, insulation consistency and other building factors to achieve a set building air tightness target which is articulated in a permeability rate. Several projects they have worked on include the 5th Largest Passive House project in the world – ‘The Woodside Building’ – and the Victorian Heart Hospital, just recently.

“We were involved early on in these projects. This allows us to look at the overall building design, to understand the various factors we need to consider in our efforts to reach the targeted air leakage rate,” said Efficiency Matrix’s leading consultant, John Konstantakopoulos.

“These projects were not only of a large-scale, but they also had quite complex roof systems, different wall types, and a dedicated vapour barrier, all of which can affect the overall air tightness.”

“Our team conducts regular build quality inspections until the buildings are completed for air tightness testing. We do this to ensure our projects have minimal air leaks which could have a major impact

on the overall air tightness levels and consequently less Stack [chimney] Effect and temperature variation up and down the building.”

Efficiency Matrix specialise in construction air tightness that reduce costs and minimise carbon footprints in commercial and residential spaces across Australia. A part of this process also smooths out the commissioning process at the end of the project, e.g. Stairwell pressurisation and HVAC commissioning.

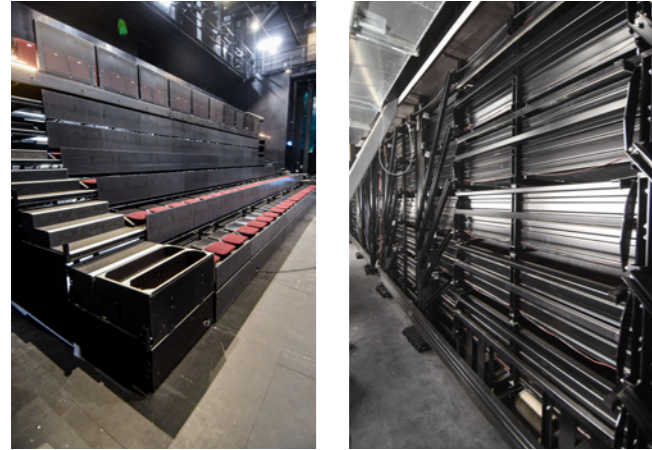
“We are passionate about a holistic approach to energy efficiency,” said John. “Particularly for large-scale high-performance building envelopes which can benefit immensely from air tightness testing and recommendations that we can provide.” Large buildings are impacted greatly by Stack Effect and high winds.”

The team has over a century of experience combined, and offer a wide range of building performance products and services to achieve the strongest return on investment on any project delivery.

For more information contact Efficiency Matrix, Unit 5/8 Garden Road, Clayton VIC 3168, phone 1300 027 874, email sales@efficiencymatrix.com, website www.efficiencymatrix.com

THE BEST SEATS IN THE HOUSE

Seating solution experts Maxwood Technology were contracted to supply and install the 180-seat custom retractable seating system in the studio theatre of the Whitehorse Performing Arts Centre.



“This state-of-the-art project presented some design challenges. Firstly, our retractable system needed to interface and integrate with two rows of fixed seating that create a balcony,” said National Sales Manager for Maxwood Technology, Declan Brennan.

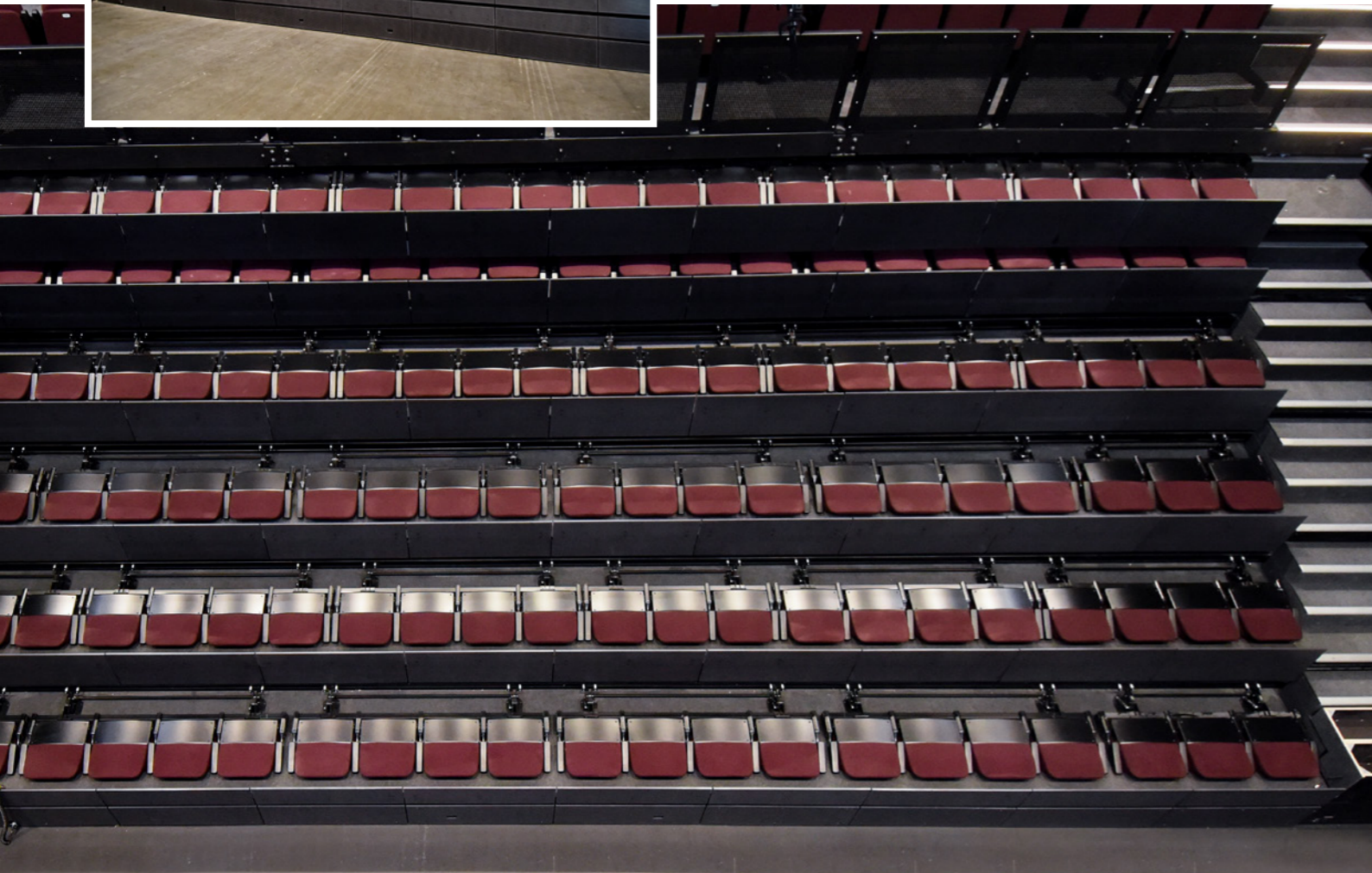
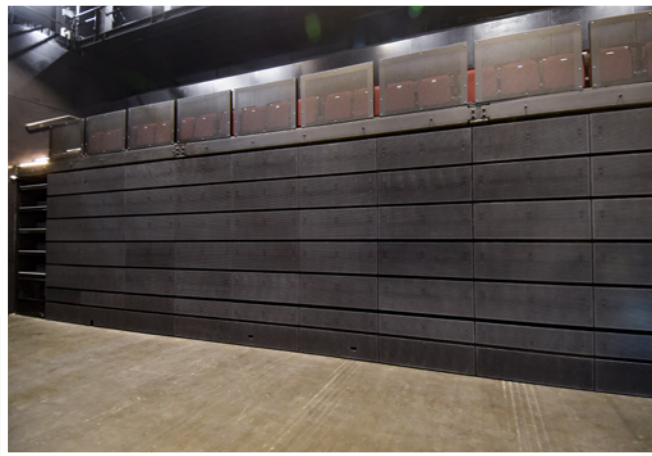
“The retractable system was also required to sit under the balcony recess to create a seamless wall effect once retracted. This leaves very little tolerance and introduces a lot of design details like the additional challenge of specific safety requirements such as step height consistency, aisle lighting effectiveness, handrail heights and loading capacities.”

The Maxwood Technology team installed the system at Whitehorse within 2 weeks, including aisle lighting installation. “The idea behind retractable seating is to blend comfort with functionality, so there are no compromises. We strive to ensure our retractable systems can be easily stored away while still maintaining the look, feel, and comfort levels of fixed seating,” said Declan.

Maxwood Technology have provided cutting-edge flooring, innovative seating solutions and unparalleled customer service across Australia and New Zealand since 1989.

Notable recent projects include the Geelong Performing Arts Centre and the Sydney Opera House studio theatre.

For more information contact Maxwood Technology, Unit 7/4 Prosperity Parade, Warriewood NSW 2102, phone 02 8407 9538, email sales@maxwoodtech.com.au, website www.maxwoodtech.com.au



A CURTAIN RAISING PERFORMANCE

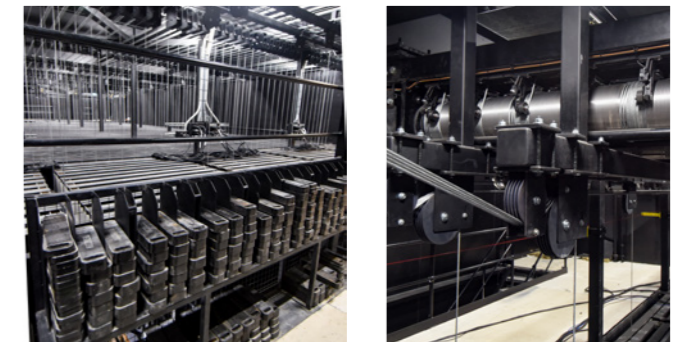
Theatre specialists Installation Theatre Engineering (ITE) were contracted to deliver a state-of-the-art theatre engineering installation including curtains, counterweight system and an orchestra lift on the Whitehorse Performing Arts Centre project.

“Amongst other things, we have installed 47 lines within the counterweight system, all with a 500kg capacity, four motorised lighting bars each with a speed of 0.5 meters per second and a motorised house curtain with a variable speed up to 1.2 meters per second. All motorised systems are powered by Zero Fleet Angle hoists,” said ITE Director, Jon Agosta.

ITE spent six months manufacturing the various required components for the system, with another 3-4 months onsite completing the stage works, hoist and orchestra pit installations.

“We ensured that all drawings and designs were accurate, technically sound, met all specification requirements, and achieved a technically impressive yet aesthetically pleasing result,” said Jon.

“The greatest design challenge we’ve faced has been the orchestra lift. To maximise the usage of the 33m² platform, it needs to be multi-functional in both the raised and lowered positions by serving as an extension of the stage, as an extension of the audience floorspace, and of course, as a designated orchestra space,” said Jon.



“The additional functionality requirements make the design quite complex, requiring two independently braked 11kW motors and mounting the platform to six SERAPID LinkLifts to lift.”

ITE is an Australian-owned theatrical equipment, engineering and supplies company established in 1980. ITE have been manufacturing and installing audio visual, concert lighting, theatre stage equipment and drapes for over 40 years.

Upcoming projects include Cowes Cultural and Community Centre, St Patrick’s College Ballarat, and the Toorak College Community & Arts Precinct.

For more information contact Installation Theatrical Engineering, 816 Lorimer Street, Port Melbourne VIC 3207, phone 03 9646 0822, email info@ite.net.au, website www.ite.net.au