Porronggitj Karrong Project

Supporting culture-led conservation of an ecological refuge

Country

Australia

Service

Environment, Sustainability

The Porronggitj Karrong project, situated in Breakwater, Geelong, Victoria, spans across 66 hectares of Barwon River floodplain and is dedicated to establishing a new cultural, recreational, and community precinct.

Developed in partnership with the Wadawurrung Traditional Owner Aboriginal Corporation (Wadawurrung), the project aims to honour both Aboriginal culture and heritage, as well as the European heritage values embodied by the heritage-listed Ovoid Sewer Aqueduct, constructed between 1912 and 1915. SMEC plays a crucial role in preserving this unique precinct and facilitating dialogue around its conservation and sustainable development.

The aqueduct, originally built to carry Geelong's outfall sewer across the Barwon River, was decommissioned in 1995 due to safety concerns related to falling concrete. In 2020, Heritage Victoria granted Barwon Water a permit to remove four out of the fourteen spans, with the condition that the remaining spans would be protected and conserved. This marked the beginning of the rehabilitation process for the 66 hectares of public open space surrounding the Aqueduct. The site is currently a large undeveloped floodplain area containing the Geelong Ovoid Sewer Aqueduct, which consists of extensive areas of native vegetation, mostly Lignum Swamp. The area's native vegetation has recolonised following the exclusion of cattle grazing at the study site in 2001.

The project is part of the First Nations – Culture & Heritage Priority Project, focused on fostering cultural tourism experiences within the greater Geelong region. One of the project's aims is to reopen a stretch of the river by 2025, enabling public access. If successful, this initiative would signify the first time since the early 1990s that the

entire length of the river would be accessible to the public, offering an opportunity for cultural exploration and appreciation.

Since the project's inception in 2018, SMEC has been actively involved in various aspects, including conducting detailed ecological assessments, ongoing ecological monitoring, statutory planning, environmental approvals, and contaminated land assessments. Collaborating closely with Wadawurrung and Barwon Water, SMEC is currently facilitating the implementation of Traditional Custodian land management practices and the development of a Healthy Country Plan. Working alongside the Wadawurrung Gobata Dja (Healthy Country) team, our SMEC team on site recorded the first-ever Tawny Grassbird identified in the Barwon region. Additionally, we identified nesting pairs of four different raptor species on the site and successfully completed our second year of quarterly native vegetation monitoring.

King Abdulaziz International Airport

Country
Saudi Arabia

Service
Aviation, Architecture, Engineering & Specialist Services, Quantity Surveying & Cost Management, Construction Management, Project Management

Jeddah Airports Company (JEDCO) appointed SJ to provide Project Management Consultancy services for the airport facilities development plan. SJ will oversee over 100 CAPEX projects, valued at 3 billion SAR – with emphasis on passenger experience and efficient processing for the millions of pilgrims who travel through King Abdulaziz International Airport (KAIA) each year during Hajj and Umrah. The planned infrastructure upgrades will increase the airports capacity from 29 million to 114 million passengers annually (MPA) by 2030.

Challenge

KAIA is about 25 km North of Jeddah city center and has a total land area of approximately 105 km2. Commissioned in 1981, it has since become the busiest and the fastest growing airport in the Kingdom of Saudi Arabia, providing commercial operations and acting as the gateway to the holy cities of Makkah and Madinah.

JEDCO, established as an independent entity under MATARAT in 2022, is steering the enhancement and expansion of KAIA as part of Vision 2030. In alignment with the National Aviation Strategy's ambitious targets, JEDCO is undertaking a major development program in modernizing its facilities to keep pace with the increase of passengers targeted to reach 114 million passengers per year in 2030. Currently over 140 CAPEX projects are planned with an estimated value of over USD one billion.

Solution

SJ's specialist Aviation team is managing various CAPEX projects in collaboration with the JEDCO Engineering team. The program of works has been developed under Vision 2030 as part of KSA's National Aviation Strategy. The team has been appointed to augment the airport's operational efficiency, passenger experience, safety, capacity expansion, commercial returns, and asset rehabilitation. Scope of services includes:

- Design Management
- Cost Management
- Construction Management
- Site Supervision
- Stakeholder Management
- Contract Administration
- Aviation Management
- Local Project Management Office
- Knowledge Transfer
- Engineering Document Control

SJ continues to work closely with JEDCO's Engineering department on their journey through operational transformation. During the initiation phase of the project the team focused on the following strategic areas:

- Established Project Governance and standardised processes such as Project Management Plan, Project Master Program, HSE Plan and reporting systems
- Dynamic/Live Dashboards
- Seamless communication mechanisms and protocols
- Robust Project Controls frameworks
- Development of risk management policies and procedures
- International best practice Project Management systems and processes
- Implementation of new value management mechanisms

As a result of process optimization, the team was able to reduce requisition times, reduce variation claims and mitigate risks across the program. During the first twelve months the team achieved notable results including:

- 46 new projects successfully tendered, collectively valued at $446 million, showcasing a strong capability in acquiring and managing a substantial project portfolio.
- Increased the on-time delivery rate of projects to 96%
- Developed clear Statements of Works (SOWs) and tailored contract conditions, which contributed to a reduction in variation claims, thereby minimising project scope changes and associated costs.
- Identified and mitigated 239 major risks across the portfolio of projects, underscoring a proactive approach to risk management and ensuring project stability.
- Streamlined the documentation and communication process, resulting in 96% of documents being responded to in a timely manner, which improved communication and decision-making throughout the project lifecycle.

Onur Yamuk, Regional Director, Aviation and Aerospace (AMEP) commented, *"Our PMC consists of a diverse, multidisciplinary team to deliver pragmatic real-world solutions. It's critical to collaborate closely with our client to fully grasp their needs and priorities, and strategically develop interventions to facilitate successful delivery of each project."*

Inland Rail Project

Value engineering on a priority rail project

Country

Australia

Service

Transport, Rail & Metro

SMEC's engineering, geotechnical and construction capability and specialist support have played a key role in the current delivery of Inland Rail and for rail infrastructure projects and maintenance well into the future.The construction of the largest A$10 billion freight rail project in Australia, networked between Melbourne and Brisbane, spanning more than 1,700km and comprised of 13 individual projects over a 10-year delivery schedule.

The vastness of the alignment presents a range of challenges which need to be addressed to ensure the successful completion of the 13 projects. Australia's varied terrain, geotechnical conditions, and geographical scale makes the Inland Rail one of

the great engineering challenges in a generation. The delivery of a project of this scale requires highly skilled technical experts across almost every discipline, from environmental scientists to rail track specialists.

Drawing on our global portfolio of interconnected skills and subject matter experts

SMEC, in a joint venture with Arup, is providing technical and advisory services on the project, drawing on our global portfolio of interconnected skills and subject matter experts.

SMEC in collaboration with Arup are providing engineering and technical advisory through specialist support across the various disciplines that make up the delivery of the railway system. A full-time core team of almost 50 experienced engineers is based in Australian Rail Track Corporation (ARTC) Brisbane office, supported by a wider group of nearly 150 Subject Matter Experts (SMEs). This has developed a highly collaborative structure between the joint venture partners and our client, enabling a team environment in which innovation is able to be fostered and capitalised upon.

In addition to providing program-wide and project-specific advisory services, our team has also developed a range of technical strategies and documents including standard design drawings, program requirements specifications and social performance reporting framework. As the program moves forward into the next phase, the team has also undertaken optimisation reviews across several projects to ensure the client is receiving value for money solutions.

Supporting economic growth

Inland Rail supports economic growth for Australia through creating a reliable freight link between Brisbane and Melbourne with transit times of less than 24 hours that is cost effective whilst ensuring efficient movement of goods across Australia’s vast east coast.

Improved infrastructure and an effective national freight operation will not only provide supply chain benefits but will also lift Australia's global competitiveness whilst delivering substantial cost savings for local producers. SMEC's engineering, geotechnical and construction capability and specialist support have played a key role in the current delivery of Inland Rail and for rail infrastructure projects and maintenance well into the future.

Crows Nest Station
Sustainability in design

Country
Australia

Service
Transport, Rail & Metro

Crows Nest station is part of the Sydney Metro, Australia's biggest public transport project, revolutionising Sydney's transport network and enabling the long-term growth of Sydney's rail network.

Crow's Nest Station is an underground station which is part of the Sydney Metro City & Southwest project. Located approximately 6km north of Sydney's CBD, the area is a growing commercial and residential precinct.

As we plan for medium and high-density urban environments that meet future population demands, suburbs like Crows Nest will be at the forefront due to their proximity to central business areas. The challenge is to incorporate sustainability and environmentally resilient features into infrastructure.

Implemented innovative engineering

SMEC was the lead consultant on the Crows Nest Design Consortium (CNDC), in partnership with Woods Bagot, Robert Bird Group, Norman Disney Young, and Oculus. CNDC provided design and technical services and were the service provider for the delivery of Design Stage 2, Stage 3 and Stage 1 primary structures.

The design team implemented innovative engineering with the use of a pre-cast concrete beam structural solution which allowed for quicker construction times which in turn meant no formwork interference at platform level. Also, to minimise materials consumption and waste generation during the construction phase, SMEC developed an operational waste management plan to leave a legacy of sustainable practices from design and construction and into operations.

- **37%** annual modelled energy consumption reduction
- **53%** reduction in potable water consumption
- **21%** reduction in construction phase greenhouse gas emissions

Revolutionising Sydney's transport network

Crows Nest station is part of the Sydney Metro, Australia's biggest public transport project which in 2024 will include 31 metro stations, revolutionising Sydney's transport network. The project aims to enable the long-term growth of Sydney's rail network, supporting improved travel times, reliability, and integration with other transport options including bus and cycling networks.

By challenging conventional practices and using innovative techniques and technology, the team were able to deliver a design that is not only sustainable but also delivers construction cost savings and improved commuter experience. The design methodology for the station was also able to inform future station designs, providing additional, long-term value to our client.

SkyOasis @ Dawson

1,192 units of 2-, 3-, 4- and 5-room flats were built to cater to residential needs

Country
Singapore

Service
Residential, Master Planning, Landscape Architecture, Architecture, Engineering & Specialist Services, Project Management, Township

SkyOasis @ Dawson is an urban oasis located in the heart of the Dawson estate in Singapore. The development comprises six residential blocks ranging from 26 to 45 storeys, offering a total of 1,192 residential units of 2-, 3-, 4-, and 5-room flats. It is one of the many projects unveiled under the "Housing in a Park" vision announced as part of the Remaking Our Heartland initiative for Dawson estate in 2007.

Dawson is conveniently located, with the city just minutes away. The nearby Queenstown MRT station connects residents to places across Singapore. Within the development, residents can find daily conveniences such as an eating house, a minimart, and shops. A Childcare Centre, a Family Service Centre, and a Social Service Office are also located in the development to serve the community.

Completed in 2021, SkyOasis @ Dawson is set within a significant setting, bounded by the Alexandra Canal Linear Park, Margaret Drive Road, Commonwealth Avenue, and Queenstown MRT station. Sited prominently at the start of the Linear Park that connects multiple developments along its spine, the development is sensitively

designed to greet residents and visitors from afar. It also capitalises on its seamless connection with the Linear Park and its surroundings.

Nestled amidst lush greenery, SkyOasis @ Dawson allows residents to enjoy various recreational facilities, including playgrounds, adult and elderly fitness stations, a jogging track, rest shelters, and precinct pavilions, where they can bond with their neighbours. An eco-deck houses a children's playground, children's slide terrace, and an adventure slope for older children.

Residents can also find quiet contemplation spots at the sky terraces located at the 14th and 35th storeys of some residential blocks. The rooftop garden above the multistorey car park provides an additional venue where residents can relax and unwind. For more recreational options, residents can stroll, cycle, or rollerblade along the adjacent Alexandra Canal Linear Park.

The landscape is designed to cater to the needs of the community through a public main green spine with a commercial plaza and a curved eco deck. A more intimate setting for the residents is provided within the central green within the community garden above the multistorey car park.

The development also boasts of two precinct pavilions – one centrally located on the north side with the first precinct drop-off porch, while the other located quietly on the southern end of the site. The precinct pavilions and small pockets of spaces in the precinct also serve as ideal locations for residents to gather and interact with one another.

SkyOasis @ Dawson offers a unique living experience that blends with nature to offer residents a quality living environment. It is designed to engage in activities beyond its own precinct and offers residents a place for contemplation and a retreat from the hectic city environment.

For its innovative design, the project was accorded the HDB Design Award 2023.

Woodlands Health Campus

Sector
Healthcare

Country
Singapore

Service
Architecture, Engineering & Specialist Services

Designed by SAA Architects, the Woodlands Health Campus envisions person-centric and quality healthcare for the community of the future by integrating three components – a strong ecosystem for community care, green spaces for patient healing and SMART technology.

Woodlands Health Campus is Singapore's first hospital with purpose-built parkland for patient healing, social interaction, and staff well-being. The design amalgamates new care models, technological innovation and medical planning into a single, seamless facility comprising of an integrated Acute and Community Hospital (ACH), Specialist Outpatient Clinics (SOC) and Long-Term Care Facility (LTC).

Designed to bring people, nature and healing together, Woodlands Health Campus has greenery woven horizontally and vertically throughout the development, serving healing and therapeutic purposes for patients, staff, and the wider community. The ground level is vehicle-free for pedestrians in an open campus design, encouraging the community to walk in and enjoy the campus grounds.

Along with the passive design features in the buildings, the facility's sustainable features will bring about 30 per cent in energy savings. The passive design features in the buildings, PV panels on the roof and greenery on the facade limit heat gain while encouraging wind flow through spaces. The open ground level spaces double up as rainwater collection channels for irrigation of the green spaces.

The SOC is placed close to the bus-stops and MRT, encouraging use of public transport. Clinical and allied health specialties are clustered according to service lines so that patients with co-morbidity will be able to consult specialists, nurses and therapists within a single touchpoint.

The LTC is a dementia-friendly facility with a cluster-living environment that promotes the dignity of residents and encourages visitation. A childcare centre is also integrated into the LTC.

The three blocks (ACH, SOC and LTC) are linked by bridges and share centralised resources such as underground car parking, a logistics hub and refuse disposal facilities where SMART technology automate dispensing and centralise records for easy access.

Shenzhen Children's Hospital Science & Education Building

Sector
Healthcare

Country
China

Service
Landscape Architecture, Architecture, Master Planning

B+H Architects, in collaboration with East China Architectural Design & Research Institute, were tasked to integrate the new building into the existing campus of Shenzhen Children's Hospital Science & Education Building and its surrounding environment to elevate the overall functionality and positioning of the facility.

The integrated design scheme weaves a cohesive response from the site planning through to architecture, medical planning, and interiors, with a special emphasis on the integration of landscape design. The design looks to engage young patients through a series of thoughtfully designed functions and installations to alleviate patients' anxiety and facilitate overall healing.

By embedding a sense of wonder into every corner of the new building, the design aims to encourage children's natural curiosity and delight and cultivate their unique and joyful view of the world, while at the same time providing the means for adults to fondly recall their childhood, and to interact with the environment in a similarly social, playful and collaborative way.

Specifically, colourful artwork, graphics, and signage inspired by nature enrich the interiors, creating a visual distraction while helping the patients, parents, and staff navigate the hospital. The design also looks to integrate play into the overall treatment process. This is not only about providing play areas and playtime but ensuring that play is a common thread running through the entire stay in the hospital.

The design strategy seeks to provide a healing experience that is full of fun. The ground floor has been created to radiate outwards with its large-scale space drawing people inwards. It presents as an urban “living room” full of colour, positive energy, and delight. The coloured graphic applied is inspired by the nearby park and the joy that brings to the communities.

At the heart of the building lies the wondrous “Secret Garden” known only to the people inside the building. It provides a safe shelter for the children, their parents and medical staff during healing and respite. By increasing the planting, lighting area and permeability, the interior space also creates a closeness to nature.

The design also seeks to incorporate the natural environment and ensure easy accessibility to the outdoors, fresh air, and sunlight. Bringing the park to the hospital forms the basis of the landscape concept. By using the structure of a tree as the inspiration for the three landscape zones, the design further integrates the natural setting with the hospital environment. This approach reflects the unique and positive role that nature plays in our lives and its ability to promote healing and overall wellness.

A ‘collaboration zone’ is located at the junction of the inpatient and research zones of Shenzhen Children’s Hospital Science & Education Building, which houses formal and informal education and social spaces for staff to mingle, share and learn together. The key principle of this 3D space planning is to encourage collaboration between clinical staff, researchers, and students.

The new building extends the existing hospital to the west, expanding clinical services and adding new facilities. It is essential to ensure the campus is handled as a united whole system with robust connections between each building, which

optimises hospital operations as well as creates a positive influence on the overall experience for all patients and visitors.

One of the key solutions in the project is to size down furniture and objects in the hospital when required for accessibility and scaling up when provoking awe and excitement when interacting with kids. By strategically and thoughtfully placing wonders and discoveries along the visiting journey, the overall design seeks to create a positive and unforgettable hospital experience for children of all ages, which is reminiscent of a fun day at the park.

St. Joseph's Home

Sector
Healthcare

Country
Singapore

Service
Architecture, Landscape Architecture

Designed by SAA Architects, St. Joseph's Home is the first nursing home in Singapore to have an integrated childcare centre and intergenerational playground. The integration of a childcare centre into a nursing home and intergenerational friendly playground with wheelchair friendly see-saw facilitate social interactions between the residents and children.

The original St. Joseph's Home, built in 1978, was a single-storey building with 139 beds, set amidst a central garden courtyard, with the red-brick Chapel building as the central focus. The redeveloped six-storey nursing home that now caters for over 400 beds, is equipped with assisted living, hospice, aged care, and dementia facilities.

The redesign positioned St. Joseph's Home as the first care home in Singapore where elderly residents could interact with the children using the infant and childcare centre built on the premises. Taking an empathic approach to design, our architects immersed themselves in the process of understanding the needs of the people who

would live and work in St Joseph's Home. In the redesign process, they built a community through a shared love for the chapel of the home, plenty of green spaces, with natural light and ventilation. The redevelopment received a Silver at the World Architecture News Awards (Healthcare Category) in 2019.

The design approach of St. Joseph's Home focused on three key pillars – designing for community, mobility and dignity. Each aspect of the design places residents' wellbeing at heart; providing for their mobility, engagement and comfort, and enhancing the total quality of care they would receive.

To provide a comfortable home for residents, natural ventilation, daylight and sun shading are maximised by orientating every ward at an angle determined by the prevailing winds and sunlight. The architects addressed the needs of each category of residents, paying special attention to those with dementia as they tend to be more sensitive to their environment.

Wide and unobstructed corridors run around the periphery of each floor, empowering residents by facilitating mobility. Bedridden residents are given a chance to enjoy the sunlight and be close to greenery outside their rooms, as the wide corridors allow caregivers to wheel their beds around.

The architects challenged standard ward arrangements to create "cluster and family" systems formed by smaller groups of residents and staff with portable nurse stations, providing the right scale for a home-like environment. Each cluster consists of 32 beds and shares smaller dining and social areas, allowing stronger communities to form, resulting in better monitoring and management of illnesses.

Communal gardens, greenery lined corridors, planters and vertical greenery are applied throughout the development to infuse pockets of green spaces on every floor. The gardens provide a home-in-a-garden environment that is conducive for rest and healing while allowing staff to immerse in nature to recharge.

HomeTeamNS Bedok Reservoir Clubhouse

Country
Singapore

Service
Landscape Architecture, Architecture, Quantity Surveying & Cost Management, Project Management

Equipped with smart digital capabilities, the clubhouse is designed to provide a seamless and innovative experience for members and visitors alike. Designed with green features, it has earned the Green Mark Platinum certification by Singapore's Building and Construction Authority.

By providing a contemporary yet harmonious space that embraces its natural setting, this waterfront clubhouse enriches the lives of its visitors, fostering a profound connection to nature and creating unforgettable memories for all who step through its doors.

HomeTeamNS Bedok Reservoir Clubhouse is Singapore's first waterfront clubhouse nestled within the Bedok Reservoir Park.

Designed by Surbana Jurong, the HomeTeamNS Bedok Reservoir Clubhouse is a state-of-the-art clubhouse offering an array of amenities, including an infinity pool with breathtaking reservoir views, 10 two-storey villas nestled in nature, and Singapore's longest indoor water slides.

The design of the five-storey clubhouse takes advantage of the existing topography and seamlessly blends into the surroundings. The careful integration with the

surrounding terrain ensures that the clubhouse becomes an intrinsic part of the Bedok Reservoir Park, creating an inviting space that complements and elevates the park’s offerings.

A key aspect of the design is the clever play on the overall facade, which instils a sense of dynamism and movement. A series of detailed screen envelopes the building on all sides which allows visage while providing relief from the western sun. This dynamic facade symbolically connects the structure to the fluidity and beauty of the reservoir’s natural environment. As a result, visitors experience a seamless transition from the interior spaces to the captivating outdoors, fostering a strong bond between the clubhouse and its surroundings. Year of Completion : 2022