



Taronga Zoo

Great Southern Oceans Exhibit

Home away from home

The success of the works undertaken by Reed Constructions Australia is indicative of the company’s dedication to positive enduring solutions.

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Sydney’s Taronga Zoo Great Southern Oceans exhibit is an ambitious \$41 million project to provide a state of the art home for the zoo’s penguins, seals and the Australian Marine Mammal Research Centre.

Spread over 1 hectare of south facing harbour foreshore within the existing zoo grounds – the project consists of a 900 seat theatre (replacing the old 1970’s seal theatre) and six separate aquatic areas divided into the shoreline pool, performance pool, a habitat pool, encounter pool, leopard seal pool, and a pool for the zoo’s resident penguins. Also located within the area, but on a level below the pools are a research facility, offices for marine biologists, and the heart of the exhibit – the six plant rooms that house the ‘Life Support Systems’. Hidden from the public’s view these plant rooms contain a complex array of filters, pumps, ventilation, protein skimmers, ozone generators, and water chemistry control systems – designed to ensure that the sea mammals and humans working in the exhibit remain healthy, visible, and clean.

Reed Constructions were well equipped to undertake a challenging project of this size. They have successfully completed refurbishment works for Taronga’s Koala Habitat a number of years previously, and the company’s extensive experience in the construction of waste treatment, reservoirs and water treatment facilities across Australia provided the ideal background for the creation of the pools and the associated highly complex infrastructure. The project was challenging not only due to its technical nature and the creation of the habitat areas –consideration for nearby residents was also taken into account during demolition of the existing structures, and the continued operations of the Zoo itself required careful coordination to ensure there were no disruptions. Other issues that impacted on the project included the preservation of the heritage listed old seal theatre façade (which now forms the entrance to the new theatre) and the conservation of the historic Port Jackson Fig trees within the site area.

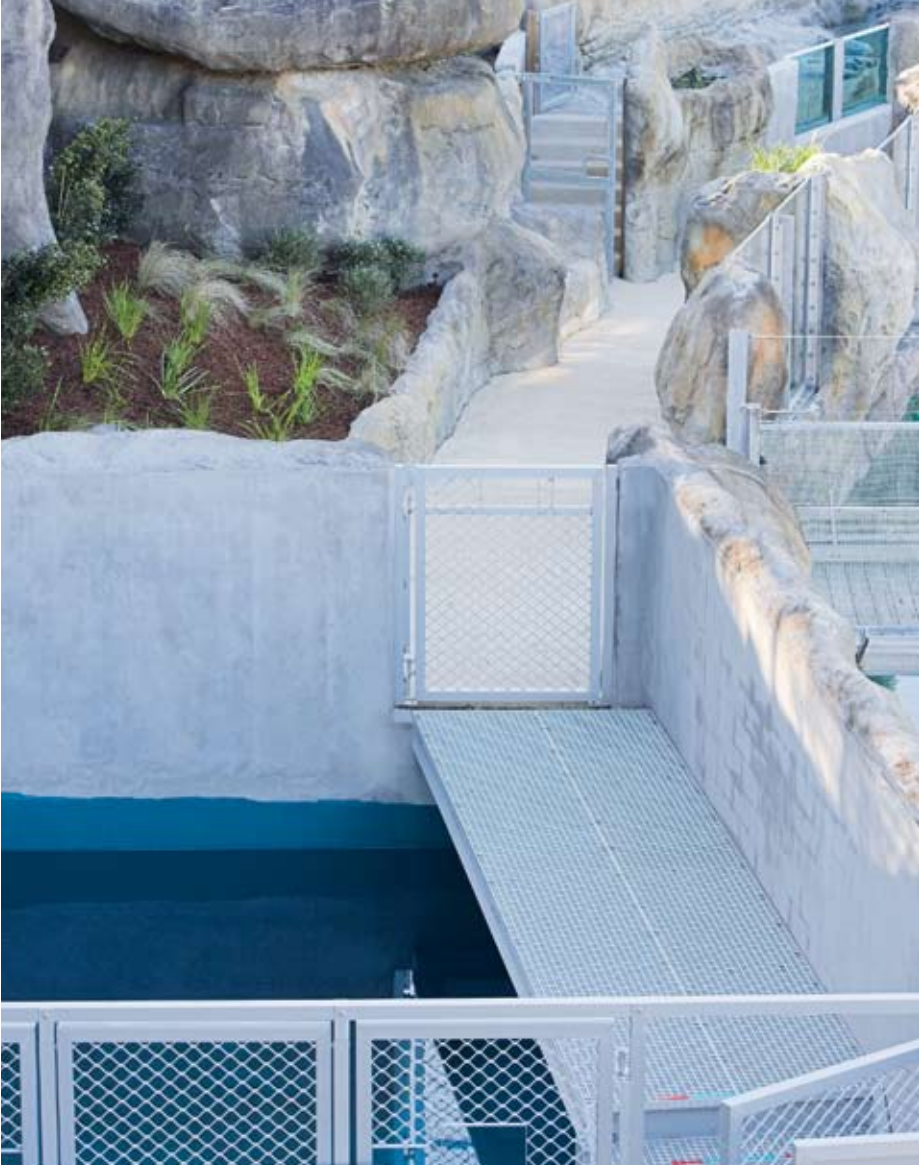
Access for all machinery was via a 300m single track road with no room for trucks to turn. Reed Constructions went to great lengths regarding the appropriate selection of machinery for the project to ensure the most efficient use of space and time. They also created a suspended concrete slab to provide manoeuvring room for the trucks, which facilitated the effective excavation of 13,000m³ of soil and completion of stage 1 six weeks ahead of schedule.

The size, variety, and nature of the pools provided additional challenges for the team from Reed Constructions. The Leopard Seal pool is 5m deep and 30m long and clever engineering has allowed the incorporation of walkways over the pool as well as extensive underwater viewing areas – the penguin pool includes a 100m long sandy beach that mimics their natural habitat.

Special care was taken during both the design and construction phases of the pools to ensure a design with minimum joints and therefore minimum points from which leakage could occur. To ensure the longevity of performance of water-retaining structures, Reed Constructions engaged concrete technology specialists Mahaffey & Associates, and in conjunction with Boral Concrete, developed a specific ‘autogenous healing concrete’. Characteristics of this concrete, along with the benefit of controlled curing of the in situ concrete, should see these structures performing well beyond their original design life.

The success of the works undertaken by Reed Constructions Australia is indicative of the company’s dedication to positive enduring solutions. Future generations of Australian and overseas visitors will benefit immeasurably from the enquiring and inventive approach adopted by Reed Constructions Australia to their work.

The completed exhibit has ensured that learning about the fascinating wildlife that abounds in the Great Southern Oceans can now be undertaken in a facility that is quite simply one of the best in the world – both for the residents and the visitors.



All the right steps

Nextep are specialists in Fibre Reinforced Plastic (FRP) structural products, and represent the leading edge in construction materials. Users of FRP products benefit, as they are light weight, durable, and extremely corrosion resistant. This was especially important for the Taronga Zoo project, due to its close proximity to salt water.

The Taronga Zoo Project includes the construction of a Marine life exhibit for the accommodation and viewing of various marine animals and birds. Nextep manufactured and installed the access covers and ladders for these wet areas, and also completed the elevated platforms and access bridge.

The ladders and platforms used on the project were assembled from FRP pultruded sections, polypropylene brackets, and polyamide resin bolts and nuts. The advantage FRP ladders and platforms have over traditional metallic products is their significantly lighter weight, which makes for easier manoeuvrability and access to the site which is positioned on the side of a hill. The rungs of the ladders were specifically designed for safety and to offer maximum slip resistance.

The position of Taronga Zoo leaves it open to a vast array of climates and conditions. Nextep's FRP products were used because of their superior advantages over climate change and their minimal deformation. The products are also maintenance free and exceptionally strong, which was of important due to the frequent use the structures will receive after the projects completion.

Nextep designed the products for the Taronga Zoo Project over an 8 month period, and then installed them over a 4 month period. The expertise and in depth planning by Nextep ensured there were no issues when installing the structures.

Nextep has been providing FRP services to Australia since 2000. Their enormous success during this short time has seen them expand to provide products internationally. They regularly provide structural services to Sydney Water.

Nextep designs and supplies the next generation in structural products, with a strong resistance to the harshest of chemicals. In many environments the anti corrosion qualities of their FRP products exceed those of stainless steel.

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The icing on the cake



The Taronga Zoo project is a themed exhibit showcasing various marine animals and birds of the Southern Ocean. To bring the exhibit to life, Reed Constructions Australia engaged art design company Mothers Art to design and build an interactive immersion environment for the new site.

Mothers Art created up to 40 different components across the site, including interpretive signage, environments for animal habitats, intricate sculptures, environmental graphics, sound chambers, scenic walkways, and interactive environments.

In order to ensure the designs not only looked great, but were safe, Mothers Art followed a comprehensive design process. Visual concepts were put forward and documented to establish the most visually enhancing designs. Samples were then taken and discussed with Taronga zoo before construction of the components began. A detailed planning and design system was essential in establishing the most immersive and interesting environment for each location on site.

Mothers Art has stringent measures in place to guarantee their work is of the highest quality



and safety for not only the public, but also for the animals inside the exhibit, who have a tendency to chew things. In keeping with world benchmarks, Mothers Art has completed thorough research into using polymers in marine environments, and actively employs the use of anti corrosion materials

Mothers Art has been excelling in art design for 25 years. Starting in television special effects, the company's continued success saw them expand into museums, zoos, aquariums, and almost anything that requires an exciting, thriving environment. They are the premiere art design company in Australia and one of the most important in the industry, due to their ability to turn even the most unusual of ideas into a living attraction.

Just a few of their many completed projects include the The Australian National Museum in Canberra, Australian War Memorial, Werribee Zoo, and Melbourne Aquarium. They created the sculptures and sound & lighting shows for the Melbourne Commonwealth Games Opening Ceremony, which was the largest sculptural project in the southern hemisphere. Mothers Art operates nationwide and employs 45 staff.



Masters of fibreglass

Master Glass Industries Pty Ltd (MGI) has been the leading manufacturer and designer of moulded fibreglass products since 1968. The Company established and maintains its reputation by providing consistent high quality results for their clients.

The company's customer base is varied and includes the hospitality industry, major fast food outlets, hotels, motels, schools, sporting venues, and petrol stations. MGI also manufactures components for the mining, building and refrigeration industries. The diverse customer range is reflected in the equally diverse range of products the company produces – from furniture to refuse bins, air conditioning panels, fire hose enclosures, train components and capsules for theme park rides to name a few.

MGI were the suppliers of all fibreglass products for the Taronga Zoo Project. This included the internal walls of the themed viewing area, steel framing, viewing panels and bulkhead framing. Working with the developers and architects, MGI

used a combination of expertise, advanced CAD design, and engineering knowledge to help create the one-off specific pattern and moulding required for the new exhibit. In house manufacturing and quality control enabled MGI to produce the required product efficiently and within cost and time constraints.

As MGI customers' needs have changed so has the company's range. In addition to a vast assortment of fibreglass products, MGI also fabricate a wide range of products in steel, timber veneers, laminated plastics and most natural stones. Additionally MGI also provide expert shop fitting services.

Master Glass Industries were founding members of the Plastics Institute of Australia (Fibreglass division) and are proud members of the Composites Australia Institute. The company's association with these institutes and others allows them to keep up with advancements and changes within the industry. This involvement and a willingness to embrace new technologies, combined with the company's considerable experience, enable

MGI to offer customers their expertise and advice with complete confidence.

For nearly 40 years, MGI has consistently achieved high levels of customer satisfaction – a source of great pride for the management and staff. The Taronga Zoo project provided an ideal opportunity to demonstrate how this satisfaction is achieved – through the quality of the company's products, service, communication and dedication to the ideal result for their clients. Naturally Master Glass Industries is delighted to have been involved with the successful project.

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Fasten your seat bolts

All structures require fastening of some form and WDS are experts in the field. Established in 1983, WDS has a long record servicing the Australian construction industry. A supplier of quality fixing systems from manufacturers both locally and abroad, WDS assists its clients with installation processes and helps solve the many connection challenges. Their experience and expertise has seen WDS provide product solutions for many civil and commercial projects including the Airport Link Tunnel, Lismore Pipeline Project, Parramatta Rail Link, Lane Cove Tunnel, Sydney Olympic Stadium, World Square, Sydney GPO and Acer Arena.

WDS stocks a broad range of construction anchoring, bolting, drilling and fastening products. They pride themselves on their ability to source specified products even if it means having them specially manufactured – like the specialised stainless steel and structural high tensile bolt product required by Reed Constructions for the Lismore Pipeline Project. As fastener specialists their team of field representatives work closely with their clients through the various stages of planning and construction.

Not willing to remain complacent WDS are constantly seeking new and innovative products and systems to assist clients in achieving greater on-site productivity. Recent additions to their product portfolio include a range of stainless steel security fixings, stainless steel hand rail and glass mounting systems; unique hydraulic expanding cement for patching, anchoring and repairing concrete and masonry; and a new product for remedial wall tying.

WDS's ability to respond quickly to their clients' needs has been a major contributor to their success and led specifically to the supply of various fastening solutions for the Great Southern Ocean Exhibit including the bolts for anchoring the spectator seating.

WDS are proud to be associated with Reed Constructions and the Great Southern Ocean Exhibit at Taronga Park Zoo.

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People power

Constructing the new Great Southern Ocean Exhibit at Taronga Zoo was no easy feat, and the project required skilled professionals available at short notice who were able to complete the difficult tasks efficiently and safely.

Christies People were engaged by Reed Constructions to provide short term labour hire for the project. Their flexible nature gave them the ability to quickly provide skilled workers during peak periods and decrease the amount of workers when demand for labourers dropped. Christies People worked with Reed Constructions during the entire development period.

Christies People's strict selection processes for candidates, and their extensive industry knowledge, has given them the cutting edge over many other recruitment agencies. The company attributes its success to their ongoing support of all their candidates, and to their commitment to constantly improve their quality of service and business practices, which has in turn given them dominance in labour hire for the construction industry.

The organisation has been providing labour hire services since 1997 and has actively sought out and developed long term working relationships with many of the construction industry's leading companies.

One of the strongest relationships developed has been with Reed Constructions, with whom Christies People has worked with on many projects, including Manly Wharf and Concord Hospital. The high reputation both companies have gained through their time working together created a huge demand from contractors to work on the Taronga Zoo Project and forced Christies People to turn eager professionals away.

Christies People works extensively throughout NSW with offices in Sydney, Brisbane, and Townsville.

The organisation continues to adopt innovative and creative ideas to update services and evolve with the ever changing construction industry. They consistently strive to be the best in providing labour solutions for clients and a great working environment for candidates.

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Sealing the deal

Sika Australia is one of the leading providers of specialist construction chemicals and chemical technology – including sealants and industrial adhesives in Australia

A significant aspect of Sydney’s Taronga Zoo Great Southern Oceans Exhibit was quite naturally the reliable and effective construction of containment areas for the 2500m³ of water required to create the six unique habitats and viewing areas. Sika Australia was engaged by Reed Constructions to provide consultation and appropriate sealants from their product range for both this and other aspects of the project.

Sika is an independent Swiss company founded almost 100 years ago. Today Sika has subsidiaries operating around the world including Australia. The Australian operations began in the 1970’s and the company has grown over the ensuing years. Sika Australia is one of the leading providers of specialist construction chemicals and chemical technology – including sealants and industrial adhesives in Australia.

Sika Australia was involved with a number of different areas within the project. One area was

the provision of suitable sealants for the seal pool that were easy to apply, durable, and importantly able to withstand the high concentration of chlorine required during super-chlorination of the pool associated with general maintenance cleaning and flushing processes.

Sika Australia provided the architects and engineers with a number of options. However due to the predicted levels of chlorination it was decided that Sikasil® WS-305 would provide the solution for sealing underwater joints. The product is a chlorine resistant 1-component silicone sealant that can withstand levels of 2ppm chlorine. The pool surfaces were treated with Sikagard®-62 a chemically resistant 2-component epoxy coating that once again was deemed resistant to the predicted chlorine levels.

The solution to the seal pool sealant was the result of close collaboration between Sika

Australia, Reed Constructions and the project architects, Jackson Teece Chesterman & Willis. This form of consultative communication is considered by Sika Australia to be integral to their operations. Clear and informative discussion and expert technical advice are one of the hallmarks of Sika Australia’s approach to their work.

Another area of the project that Sika Australia was able to provide assistance with was the provision of a suitable foot-trafficable sealant for the expansion joints situated within the sandstone coloured concrete walkways that leads around the exhibit and surrounds. Sikaflex®-PRO is a sandstone pigmented sealant that was colour matched perfectly to the colour of the concrete paths. However Sika Australia suggested it was not durable enough to be used in a high traffic area such as the walkways. A solution was the minimisation of the walkway expansion joints to approx 5mm. This reduced

width, with the inclusion of a recession enabled the effective use of Sikaflex®-PRO by shielding it from high foot-traffic volume.

Sika Australia’s areas of operation are as diverse as its product range. Currently the company is involved in numerous repair & construction projects in the water industry such as Sewerage Treatment Plants and Water Treatment Plants. They are also heavily involved in construction/ remediation of various commercial apartment projects and the carbon fibre structural strengthening of concrete slabs and elements on building projects along with any number of other endeavours.

However, their involvement of the Taronga Zoo Great Southern Oceans Exhibit will surely stand out as a significant highlight that demonstrates not only the versatility of their products, but also the adaptability of their team in seeking solutions.



