



Taronga Zoo

Sydney, New South Wales



Project Overview

The KingZip system from Kingspan Insulated Panels has been used to construct an acoustic roof for the new Centenary Theatre at Sydney's iconic Taronga Zoo.

Overlooking the harbour and located alongside the giraffe enclosure, the 270° theatre was built to celebrate the zoo's 100-year anniversary and will be used for a range of interactive experiences to boost visitor engagement.

Location

Sydney, New South Wales, Australia

Roof Products

KingZip Linea 400 Standing Seam Roof System in Aluminium, finished in PVDF3 custom Grey.

Kingspan RD 100/825 Structural Steel Deck, perforated and polyester coated Black.



Keeping the noise down

"The acoustic performance of the theatre's roof was an important consideration for the project," explains Andrew Chippindall from Taronga Zoo, who led the development of the Centenary Theatre. "The space was required to accommodate very high levels of audio. It is home to a 25-metre screen that will be used to show videos, and provides a versatile space for hosting various presentations and visitor activities. Given the theatre's proximity to animal enclosures, the roof needed to limit the internal and external noise breakout and control reverberation to minimise discomfort to the animals."

Kingspan Insulated Panels' technical team worked closely with Tanner Kibble Denton Architects (TKD Architects) to design a bespoke KingZip roofing system to meet the project's acoustic, design and structural requirements.

"We were seeking a single system that could meet the acoustic needs of the roof, while also achieving complex geometry, accommodating box gutters and providing an internal finish," said Robin Sampson, senior graduate of architecture at TKD Architects. "Three systems were considered: a traditional built up roof, KingZip and another proprietary roofing system."

"The traditional system was discounted due to the difficulty in achieving the acoustic performance without installing a separate ceiling, as well as the complications involved in concealing the box gutters in the perimeter of the building. While both proprietary systems met the project's technical requirements, KingZip was ultimately specified because of its exposed perforated metal trough deck aesthetic, structural span capabilities, and ability to hang services from the roof."

Architect
TKD Architects

Builder
Kane Constructions

Installer
Skyview Roofing

Architectural
Roof Systems

"The roof of this very special building is highly visible and we realised that it was as important to find a roof system that was refined and could deliver all the technical attributes needed."

Alex Kibble, Managing Director, TKD Architects.

Beauty and performance

The roof comprises three sections: the main roof constructed using KingZip Linea 400; a concealed box gutter; and overhanging zinc eaves.

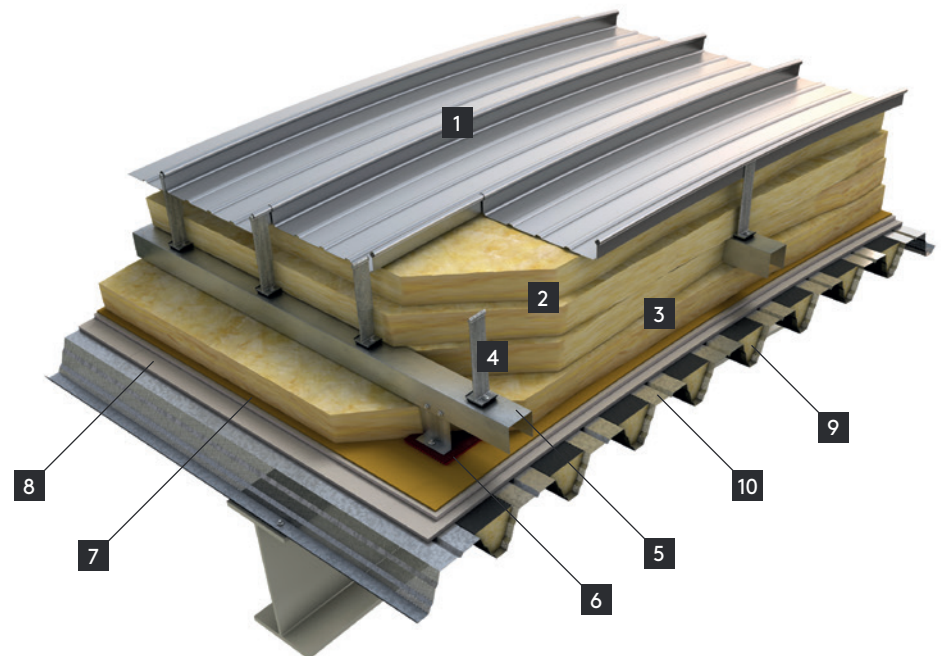
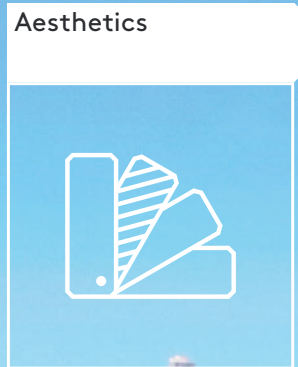
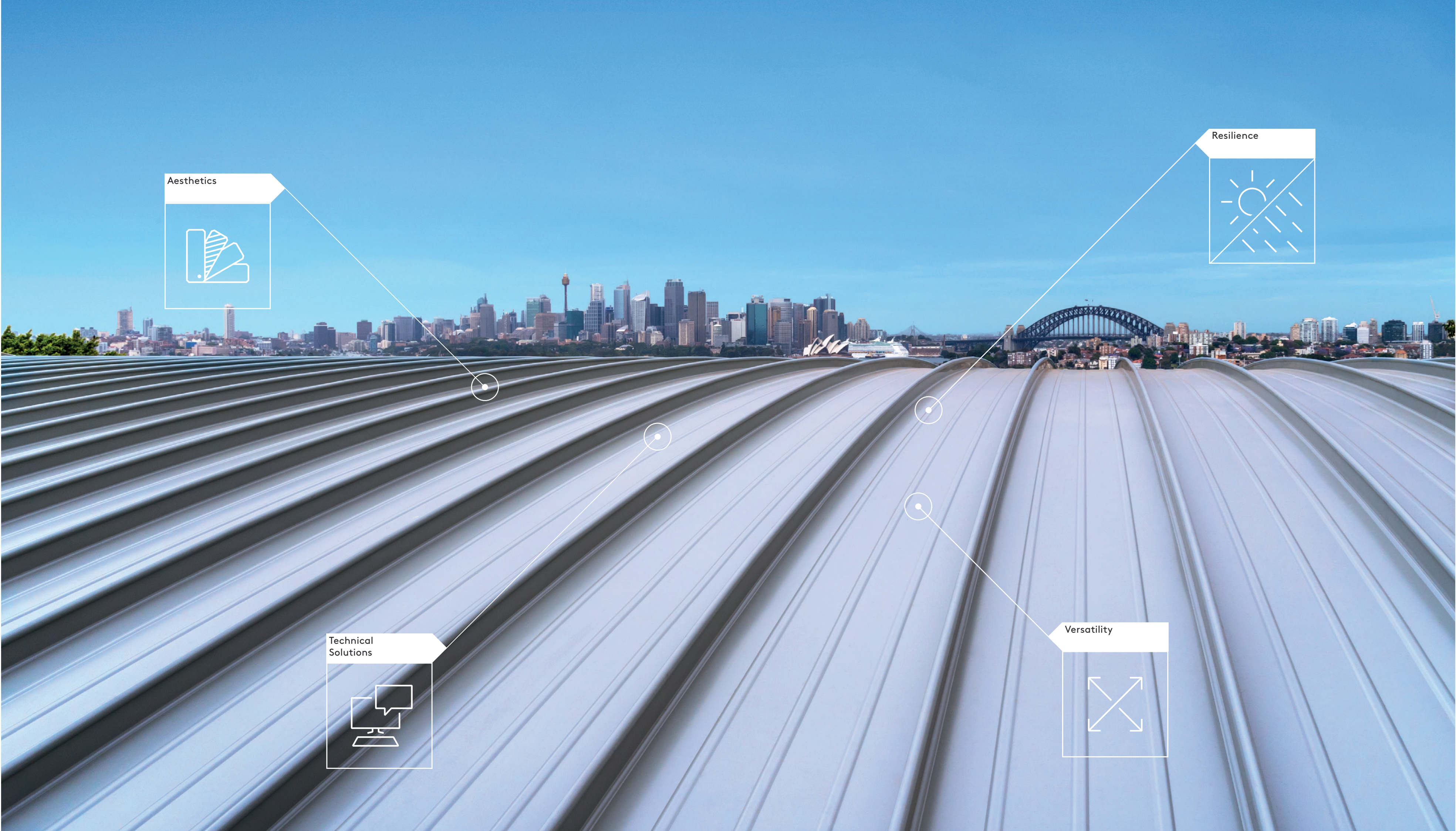
KingZip was built with a 1.25mm perforated steel lining and acoustic insulation that faces into the theatre’s interior, enhancing sound absorption. An acoustic membrane and mass layers provide a barrier to assist with reducing noise breakout.

The KingZip roof also features a sound-isolated spacer system and thermal insulation to enhance thermal performance.

It is designed to withstand the harsh marine influences of the theatre’s harbour-side location. The top layer is constructed with aluminium standing seam panels finished in a three-coat PVDF paint system to meet durability and warranty specifications. Kingspan developed a custom paint colour to match the zinc used for the eaves detail, providing a consistent and seamless finish.

As a customisable roofing system, KingZip Linea 400 was adapted to meet the architect’s aesthetic and design requirements. *“The curved design of the roof reinforces the curvature of the building in plan, while also reflecting the special requirements internally. The standing seam system provided an ideal product to tie in with the vertically orientated façade treatment while also providing a minimal, clean and crisp finish which expressed the curvature of the roof,”* said Mr Sampson.

KingZip was curved offsite and supplied ready to install while Zoo operations continued as normal, as well as working within the tight site constraints. While the Kingpan system forms the main roof, an inset membrane lined gutter allows the roof’s over hanging eaves and bull nose, zinc edge to be expressed, while omitting rain water run-off and concealing down pipes.



- | | |
|--|---|
| 1 KingZip Linea 400, 0.9mm aluminium, custom grey PVDF3 coated | 6 Embelton Shearflex pad |
| 2 2No. layers 100mm mineral wool insulation | 7 Tecsound 100 acoustic membrane |
| 3 2No. layers 125mm mineral wool insulation | 8 2No. 13mm plasterboard |
| 4 245mm halter with thermal pad | 9 Acoustic insulation, black tissue faced |
| 5 Steel channel with 170mm spacer bracket | 10 Kingspan RD100/850 structural deck, 1.25mm steel, web perforated, black polyester coated |

A structural deck was constructed with 6-metre spans between rafters, which eliminated the need for purlins. This enclosed the building and provided a platform for roof installation, giving internal trades access to the interior and removing them from the critical path.

“Selecting an experienced supplier with a tested system and the technical expertise to develop and advise on detailed design elements was vital for this project. Kingspan provide a high level of service through-out the documentation stage of the project, enabling us to develop the roof design efficiently and with no compromise to the client’s expectations,” said Mr Sampson.

Mr Chippindall said: *“We are very happy with the KingZip roof. Acoustic testing has been completed and acoustically, the roof performs very well. The Zoo hosted its first movie showing during a torrential storm and the hail was almost imperceptible – which is a great result for a metal-coated roof.”*

360° Service & Support

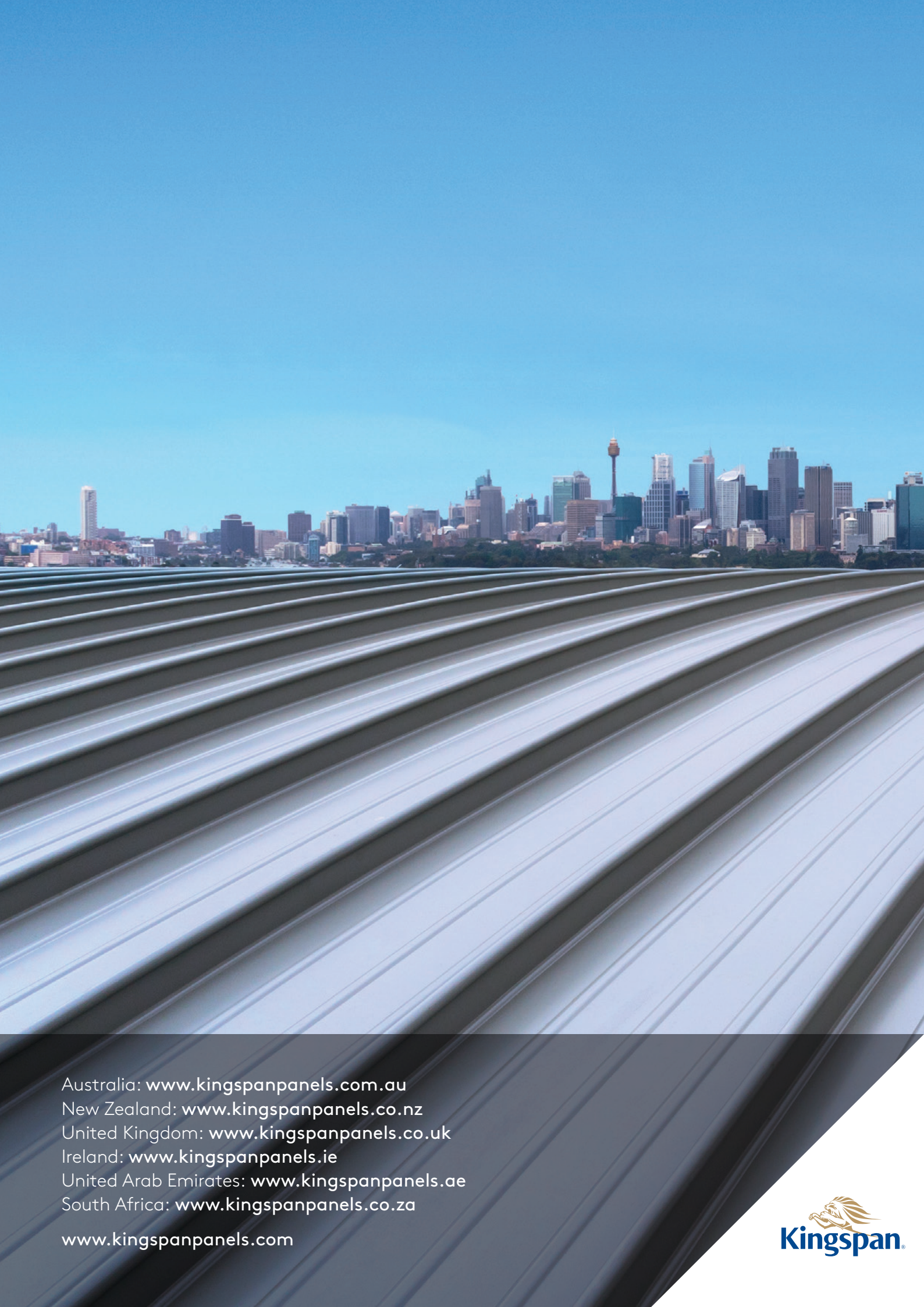
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Creative Architectural Solutions

From the outset, we work closely with each client to provide creative solutions to their specific needs. Our technical team are on hand at every stage to deliver innovative, high-performance architectural solutions for complex and major projects across the globe.

With the development of numerous CAD and other software packages, architects and design teams are creating increasingly complex geometric forms to meet demanding aesthetic and performance criteria required by their clients. To support designers, our technical team work with a variety of softwares.





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