

## An iconic structure

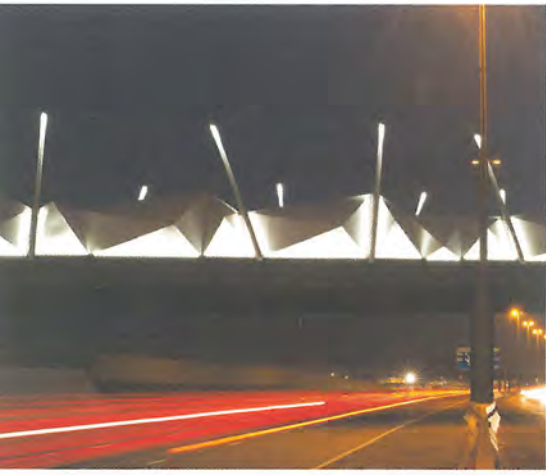
One of the most spectacular road bridges ever designed and built in Africa has been illuminated by BEKA's contemporary LED lighting products.

Pieter Mathews and Associates Architects cc was commissioned by the South African National Roads Agency (SANRAL) to design a bridge in Nellmapius Road over the N1 highway.

The bridge had to act as a gateway to the new Gauteng Freeway Improvement Project. It spans the N1 highway, one of the busiest highways in Africa, which connects Pretoria to Johannesburg. The bridge also spans the Gautrain railway line, which runs parallel to the highway and carries Gauteng's new high-speed train. The unique façade of the bridge was designed for the structural and bridge engineers, BKS (Pty) Ltd.

The construction of the Nellmapius Bridge was completed in 2011, and was followed by the signature bridge façade, inspired by the architect who got the idea of exploiting the magic of fractal geometry when his young son showed him a book on origami.

The notion of random and the art of origami were combined in a metaphor for the many facets of the vibrant province of Gauteng and South Africa as a whole. To simplify the manufacturing process, only two angles were used in the entire façade design, together with five panel types, which can be connected in various configurations to create a completely random appearance (an ordered disorder).



*The concept of the bridge design was to create a 3D effect, which was realised by the multi-faceted design of the bridge wall, highlighted through LED lighting.*

The origami-derived shapes also help to deflect sound, creating a more pleasant environment for pedestrians on the bridge, while their solidity and height ensure that all objects stay on the bridge, making it safer for motorists passing below. The panels and masts were manufactured from steel, chosen for its sculptural and recyclable properties.

Lighting design played a vital role, as the powerful three-dimensional image had to be retained at night. Each bottom facet is lit by cold white LED lights, with the rest of the facets on the panels receding into the dark. At night, this becomes an analogy and reference to the heartbeat, and hustle and bustle of Gauteng's cities. The LED cold white light further accentuates the three-dimensional, random effect of the bridge panels and projects this jagged heartbeat line on the night sky.

A total of 239 BEKA LEDbeam and 64 BEKA LEDrail luminaires of various lengths and configurations were installed to highlight the 3D structure of the bridge, and the top of the I-beams. BEKA's products were chosen by the professional team for their quality and reliability.

BEKA is proud to have provided the lighting solutions for this project and values its association with the client, SANRAL, and the professional team involved: Mathews & Associates Architects; BKS Consulting, which developed the structural design with the architects and BKS electrical department, responsible for the lighting design.

The design of the Nellmapius Bridge will be exhibited – by invitation – at the Venice Architecture Biennale from 29 August to 25 November 2012.

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*BEKA's LED luminaires light the iconic bridge at the entrance to Pretoria*

