



**Royal
HaskoningDHV**
Enhancing Society Together

Client | South African National
Roads Agency Limited

Blackburn Pedestrian Bridge
Completion: June 2010
Value: ZAR 40 million



Saving lives

For the residents of Blackburn Village getting to work every day meant putting their lives at risk by crossing the national road near Umhlanga north of Durban in KwaZulu-Natal, South Africa. The high accident rate was unacceptable and the South African National Roads Agency Limited (SANRAL) commissioned Royal HaskoningDHV to plan a new pedestrian bridge. At the natural site for the bridge, confirmed in consultation with the Blackburn community, the carriageways are separated by an 80 m wide natural valley with an environmentally sensitive stream.

The 177.5 m Blackburn Pedestrian Bridge is one of the longest cable-stayed pedestrian bridges in Africa. Coupled with its uniquely shaped pylon and aesthetic lighting, the structure is a landmark project in South Africa.

The project was constrained by two rigid deadlines: the FIFA 2010 World Cup and the opening of the new King Shaka International Airport. Even minor oversights could have caused extremely costly delays.

Bridge deck dynamics

Built-in wind-resistance

The long span solution required serious consideration of the bridge deck dynamics. Past lessons learned from wind-induced galloping at the Tacoma Narrows Bridge

and footfall-induced side sway at the London Millennium Bridge were taken into account.

A wind-expert was consulted to ensure there were no site-specific wind-related issues. Potential for the deck shape to contribute to deck sway or resonance and pinging in cable stays were investigated along with footfall-induced vibrations, vertically, laterally and torsionally using 2D and 3D models.

Both South African codes and developing international structural design concepts were consulted to ensure a stable bridge deck. The detailing also required technical expertise and careful attention to detail. The protection to the cable stays are a critical element as the loss of support through vandalism or terrorism could cause the collapse of the bridge.

LED aesthetics

Lit up for longer

Because of the unique nature of the bridge, both safety and aesthetic lighting were designed. The final scope of works comprised the installation of cutting edge LED lighting which provided both safety lighting and decorative lighting. The benefits of the LED lighting was a reduction of electrical consumption costs to 10% of the original proposal and an increase in the expected life of some of the larger globes from 900 hour to 20,000 hours.



Saving lives

Reaching out

Hands-on with community

During the eleven month contract period, three community outreach initiatives were planned. Inspired by the upcoming FIFA 2010 World Cup event in South Africa, a soccer tournament between teams in and around Blackburn was organised and sponsored to include soccer kits and trophies.

A bridge building competition was held for students at the local school. Prizes for participation as well as strength and aesthetics were provided to promote career and education awareness as well as road traffic safety.

Lastly, children from the community were invited to place their handprints in concrete panels that would form part of the bridge's approach. The intent of all three initiatives

was to promote a sense of goodwill and project ownership amongst Blackburn Village residents regardless of involvement in the construction process.

The project has achieved this in many ways and Blackburn Pedestrian Bridge's important role for the community has been highlighted by follow up pedestrian surveys available on YouTube indicating 100% use of the structure and the elimination of vehicle accidents.

Brian Downie

T: +27 (31) 719 5500 M: +27 (0) 82 892 7082

E: brian.downie@rhdhv.com

youtube.com/watch?v=upN6cba5MLg

