Bruma Lake Bridge to receive a much needed facelift

The Bruma Lake Bridge is one of the iconic features of the Johannesburg east area. The bridge has remained in its original state since the 1980s and is mostly used by pedestrians crossing over the Jukskei River to access the Bruma Lifestyle Centre.

However, over the past three decades the natural elements have caused a significant amount of corrosion. As part of the rehabilitation of the Bruma Lake business precinct, Boksán Projects partnered with the main contractor, Basil Read & ARQ Consulting Engineers, who was the driving force in giving the Bruma Lake Bridge a much needed facelift. Boksán then looked to Prokon Software Consultants as not only their Autodesk reseller, but also as their trusted advisor.

“The challenge was to make use of existing structural elements as much as possible to manage project costing,” says Wayne Page, a structural detailer at Boksán. “It’s therefore important to maintain the original structure of the bridge, which is a cambered profile suspended from steel cables with balustrades that have a unique design, rolled-profiled hand-railing and shaped stanchions.

“The concrete pillars and other parts of the bridge can be refurbished to restore the bridge to its former glory as well as ensure that the natural elements would cause minimal corrosion in the years to come.”

Detailed drawings

Another common problem with the refurbishment of old buildings and structures is that the original architectural drawings are paper-based hand-drawings that can get damaged or lost which means that years later, contractors need to recreate the drawing to carry out any repair work required. Detailed drawings are crucial to the success of construction projects because they ensure accuracy, while also enabling the planning of other details like transporting and lifting the structure.

Bridge detailing always presents a challenge to architects as each bridge is unique. To manage the re-drafting of the bridge's plans, Boksán used the technology offered by the Advance Steel 2015 package from Autodesk on the AutoCAD platform. Advance Steel detailing software helps accelerate design, steel detailing, steel fabrication, and steel construction. It also improves accuracy, reduces time to fabrication, and enables a more connected workflow.

Prokon Software Consultants provided Boksán with all the training required to use Autodesk Advance Steel to its fullest potential, Prokon continues to provide Boksán with technical support to ensure that their part of the project runs according to plan. "With Autodesk Advance Steel we were able to model the existing bridge structures with little complication. The 3D model generation made for easy viewing of the external design of the bridge as well as the fitting of internal members with regards to practical connections," says Page.

Diverse functions

"The steel detailing, draughting and creation of shop drawings in Advance Steel is quite easy in comparison to other packages I have reviewed. So we were able to detail cambered plates quickly and all the other bridge parts on this software because of the programme's diverse functions. Other software options in the market don't have the advanced pillar functions. It is quite amazing what can be done with plating on Advance Steel," he adds.

The bridge was trial assembled off site in the factory in Olifantsfontein to ensure a seamless and correct fit as no mistakes can be afforded on site. "The advantage, of course, is that much of the structure is pre-assembled in a controlled workshop environment and less time is wasted on site when erecting the bridge," explains Page.

Once it is completed, the bridge will be transported to the building site; this will be done after dark when there is less traffic around. It will be assembled piece by piece, using scuffling bolts under the bridge to support it, two to three parts at a time. Upon erection, the metal surfaces of the bridge will be painted with a specialised heavy duty anti-corrosion paint system that can withstand harsh environmental elements.

The project is scheduled for completion by end of April 2016.