



CATEGORY PARTNER

ARMCO DELIVERS CHALLENGING STRUCTURAL DESIGN REQUIREMENTS

When Armco, a specialist in corrugated steel bridge structures with extensive experience in the design, manufacture and supply of structures in remote parts of Africa, was approached with a task to provide a solution for the drainage section of a large gold mining project in east Africa, the company was ready to utilise its expertise to execute the project on a tight budget and deadline while overcoming challenging structural and hydraulic design requirements.

Armco was approached by an engineering, procurement and construction management contractor working on the project entailing building an access road to the mine to be used by large mining vehicles daily. The scope was to provide a solution for 19 culvert crossings and two bridge structures required at various locations along the road.

“During our initial meeting the client advised us that sourcing concrete was extremely difficult and very expensive. Armco was approached because of the minimal integration need for concrete with our structures. We also understood that this project had to be executed on a tight budget and deadline while overcoming challenging structural and hydraulic design requirements,” explains Justin Naidoo, general manager of construction products.

With over 400 options in its product portfolio, Naidoo says the company had to find a structure that meets

the design requirement at each location while keeping a close watch on the allocated budget.

“We had to ensure that the selected structures could be manufactured and supplied within the agreed date. Our suppliers understood the time constraint on this project and worked closely with us to make sure the supply of the 750 t of steel required would not be a problem.”

SURMOUNTING THE CHALLENGES

There were a few challenges Armco had to overcome to find the right solution, while also being proactive to foresee any challenges that may arise at a later stage, including:

- Finding one structure that could meet both the structural loading and hydraulic design requirement. In some instances, the company required larger structures to meet the hydraulic requirement but could not meet the structural loading criteria.
- Contractors' knowledge and experience in installing Armco structures. Due to the structures being supplied completely knocked down (CKD), with 21 structures and the installation contractor unknown to Armco, the company needed to minimise the risk of structures not getting mixed up on site and installed correctly.
- Optimising the logistics. To ship the structures to their destination, Armco had to load them into 63 x 20ft G.P. containers, with some having to be split over multiple containers. The containers were also split into nine batches over a period of six months.

BROWNFIELDS EXPANSION

Any miscommunication and confusion could have resulted in delays and proved costly to the project.

“Considering the risks and challenges faced, Armco together with the client agreed on using only three Armco arch profile pipes over the 19 culverts. These structures met the hydraulic capacity criteria and required only a slight structural loading design adjustment from the client. The option to use only three profiles was preferred to keep the variance of structure profiles to a minimal. The two bridge structures selected by the client were our larger superspan and horseshoe arch structures,” elaborates Naidoo.

He adds that due to the local contractor having no experience in installing Armco structures, the client opted to use Armco’s preferred installer in a supervisory role to ensure that the contractor installed the structure as per Armco’s requirement.

“Each structure was colour coded so that the contractor could easily identify it and to avoid any mix-up of the structure plates during installation. Every structure also had its own installation drawing showing the number of structure plates, which helped to speed up the installation time.”

For structures that were split into multiple containers, the client was provided with a spreadsheet showing the container number and the structure name that was loaded in that container so it could be easily identified prior to offloading on site.

Naidoo says Armco worked closely with the client at every stage of the project to ensure any issues were resolved swiftly. “At Armco, we strive to provide an excellent product and service of the highest standard. Armco is not just the name of our company, it’s our brand. Our brand is not only proven through the quality of our product but also our service.”

ADAPTING TO CHANGING CLIENT NEEDS

One of the biggest challenges Armco faces in the mining projects it works on is finding structures that meet all the client’s design criteria. In some instances, the criteria changes, making it necessary for the company to be able to adapt to ensure that its solutions are still viable.

Some of the changes the company constantly has to adapt to include larger structures being required while

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Justin Naidoo

maintaining the same overall structural design criteria, hydraulic capacity requirement increases and both structural loading requirement and the structure size increasing.

Naidoo says Armco has been able to succeed in this business because it understands that changes are a natural part of operations, requiring it to always be well equipped to adapt. “Our extensive knowledge and experience in supplying large structures to the mining industry puts us in a position to be able to adapt and ensure that we always find a solution for the client.”

He adds that the company works with various stakeholders within its supply chain and always ensures that it is on top of its game by constantly communicating with suppliers to make sure delays are minimal. “Our partners understand that our products are manufactured ‘just-in-time’ and that any delays could have a knock-on effect in the production deadline.”

