Award for QMM Ilmenite project

Consulting engineering and project implementation firm Hatch's involvement in Rio Tinto's QIT Madagascar Minerals [QMM] Ilmenite Project saw its wet plant team of innovative design engineers clinching first place in the export category of this year's prestigious South African Institute of Steel Construction [SAISC] Awards. The project was executed by the Mandena Joint Venture on which Hatch and Fluor were partners.

As a direct result of the work put in by Hatch's civil/structural engineering team, the QMM Ilmenite Project overcame logistical problems, as well as various wet- and dry-plant design challenges. "Owing to the remote location of the project, every single component that was used in the development and construction of the mine had to be imported," says Structural Lead Engineer Mornè Fourie. "Everything that needed to be on site, had to be sent either by ship or plane."

The unavailability of a commercial port required that the existing port be dredged and deepened and the pier and quayside also had to be modified, allowing barges to enter. Hatch Logistics Controller Estè Visser explains that cyclones in the region resulted in the loss of two barges, forcing the company to mobilise additional barges in an effort to have minimum impact on the project schedule. In addition, the size of the available runway meant that only smaller aircrafts could be accommodated for, and landing could only take place during daylight.

The condition of the roads from the port and the airstrip to the site of the project posed yet another serious challenge. The first available route ran straight through the middle of Fort-Dauphin, a main town with an estimated population of 45944 people. Route surveys were carried out, which resulted in a deviation of the road around the town. "Owing to an agreement between Rio Tinto and the Madagascan government, which stated that all activities revolving around the project be sustainable, the areas where roadwork construction took place had to be rehabilitated upon completion of the road. What's more, part of the project construction phase fell in Madagascar's rainy season, resulting in a three week trip for trucks travelling from Tulear port to the site. In the dry season, this journey would normally average seven days," explains Estè.

Before construction of the mine could commence, the Mandena JV was required to design and build extensive ancillary services and infrastructure – including a power station, housing estates, construction villages, road network, water supply and communications networks. Following on from this, Mornè notes that the team was also commissioned to design and build a wet plant, consisting of a floating platform and a dry plant, consisting of drainage bays, dry mill buildings and a filter building. The initial amount of fabricated steel, equipment and other material required for shipment was 154000 freight tons.

In addition to the prestigious SAISC Award, the project won the Rio Tinto Global CEO Safety Award for completing the project with more than 12 million lost time injury [LTI] free man hours.

Hatch's engineering team improved workflows and reduced costs by deploying various computer-aided engineering programmes. "Streamlining the 2-D drawing delivery process also expedited steel fabrication, and improved the critical path schedule for construction. This resulted in the Hatch engineering team winning a Bentley Award on this project," Mornè explains.

Through several years of planning and interaction with this community prior to project commencement, QMM was able to develop a profound understanding of its responsibility to the region. Today, this project adds value to the people of Fort Dauphin and Madagascar through the inclusive vision of the Rio Tinto subsidiary.

Estè adds that the most beneficial improvement to the local infrastructure has been the construction of a new port with extensive load-out facilities to replace the underdeveloped port in Fort Dauphin. The port is a multi-user facility, and the national government will take full ownership of the facility at the closure of the mine.

Furthermore, a network of haul roads for the mine has been constructed, and is already in use by the local population, and the residents of Fort Dauphin will also enjoy the benefits of a constant power supply from the new power station at the mine. Community impact has however, not only come in the form of infrastructural improvements. The construction phase brought thousands of Malagasy to site during the recruitment drive.

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The mine has since moved into its operational phase, and the permanent staff retained on the project is 550, of which, Malagasy accounts for 505. These individuals have received more than 12000 man hours of training, and now retain specialised skills for Madagascar. In addition, the project has indirectly resulted in a number of spin-off industries, with 300 new businesses registering in the area since construction commenced. Tourist visits to the area has also seen marked increases since 2005, and other spin-off effects include improvements to the state of local health and education.

The wet plant before the pond was filled for float off.