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Third Contract Award For Weba Chute Systems Underlines Tnt's Commitment

Three contract awards on three different continents underlines the confidence that Terra Nova Technologies (TNT) has in South Africa's Weba Chute Systems from M&J Engineering. TNT's comprehensive understanding of the benefits that Weba Chute Systems provide in the mining sector led to the most recent contract award for eight chutes at the Morenci opencast copper mine in Southeast Arizona in the United States.

"Preceding this award, M&J Engineering Weba Chute Systems is currently supplying seven chutes to the FMG (Fortesque Metals Group) Solomon Mine in Western Australia and recently supplied chutes to Kisladag mine in Turkey," says Alwin Nienaber, technical director of M&J Engineering.

"We have developed a strategic relationship with US-based TNT which is founded on mutual trust. By carefully analysing the specific needs of each application, we are able to customise solutions that are completely targeted to increase productivity, decrease downtime and maintenance, and provide a better flow of product," he continues.

The Morenci copper ore mine is owned by Freeport-McMoran and the mining and milling capacity expansion project at the mine will allow it to process additional sulphide ore identified through exploratory drilling. The project is targeting incremental annual copper production of approximately 102 million kilograms in 2014 (a 40% increase from 2012) through increases in mining rates to 815 mtd (metric tons per day) and milling rates to 115 000 mtd (metric tons per day).

The first order for the mine is almost completed and comprises three belt to belt transfer chutes. The first two chutes have been commissioned and are operating successfully. These chutes are located on one of the main lines feeding the mine for leach (MFL) stockpile. They are

designed to handle 4 200 tph (tons per hour) on 1 372 mm width belts, running at a speed of 3.6 m/s, with lump sizes of up to 240 mm.

“Our engineering team leveraged their extensive knowledge to tackle the presence of the extremely abrasive material which needs to be handled by the chutes. In addition, the design addressed the client’s concerns around the blockages which occur when the ore is inclined to become sticky during the monsoon season and when mining Diabase deposits,” Nienaber explains.

The five chutes for the second order have been delivered, with installation planned for the fourth quarter of 2013. These chutes will be used for the on sized and screened material of minus 64 mm, which travels from the process plant to the heap leach stockpile.

“This portion of the project presented the M&J Engineering team with a number of engineering challenges. TNT requested a transfer system that would require extended service intervals in order to accommodate the mine’s protracted operational hours. In addition, while the environment is typically very dry, it is however exposed to periodic heavy rainfall at times and the system and the transfer chutes therefore have to cope with the conveying of wet and sticky material,” Nienaber points out.

In order to ensure that the solution closely matches the problem, M&J Engineering deployed an engineer to site to assess the actual conditions. “Based on this feedback and data supplied by TNT and the mine, we were able to engineer chute systems capable of meeting the application and material requirements. We are completely confident that this is a best practice solution, since all data was verified using in-house systems that include discrete element modelling,” Nienaber adds.

With forward planning in mind, the system has been engineered to facilitate the installation of air cannons in strategic locations, should this be required at a later stage.

In addition to the Morenci orders, Freeport-McMoran has awarded M&J Engineering the contract to design two chutes for the Safford opencast copper mine in Arizona. These chutes are handling agglomerated copper ore on its way to the heap leach stockpile.

The Safford mine is one of the most environmentally advanced copper mines ever built and consists of two copper deposits that have oxide mineralisation overlaying primary copper sulphide mineralisation. Safford is a mine-for-leach operation and produces copper cathodes. The operation consists of two open pits feeding a crushing facility with a capacity of 103 000 mtd (metric tons per day). The crushed ore is delivered to a single leach pad by a series of overland and portable conveyors.

Nienaber explains that the chutes are designed to transfer ore to which acid has been added. The chutes will be lined with ceramic tiles to combat toxicity and the acidity of the material. For this reason, the client has refrained from using cascade chutes.

“We advised that the client uses the Webba superflow technology to ensure that full flow of the material is maintained throughout the transfer point. The superflow design overcomes most of the disadvantages of traditional transfer chute designs, such as generation of unwanted fines, excessive wear and tear, noise and dust pollution, spillage, excessive impact and subsequent belt damage. The Stafford mine design also makes use of inserts for quick maintenance and minimised downtime,” Nienaber says.

“Our reputation is built on our ability to carefully analyse each specific client application and devise a solution that will resolve any transfer issues they may encounter. Our engineering and design team utilises its extensive background in providing transfer chutes for a number of local and international mining clients,” Nienaber concludes.

MORENCI MINE PIC 01 : The landscape of Freeport-McMoran's Morenci Mine, located in South Arizona, USA.

MORENCI MINE PIC 02 : The bottom section at the tail end of one of two Webba Chute Systems installed at Morenci Mine, South Arizona, USA.

MORENCI MINE PIC 03 : The reverse section of one of Weba Chute Systems installed at Morenci Mine, South Arizona, USA.

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