

# ASH RESOURCES

## MATERIALS FOR TODAY AND THE FUTURE

**Dr Hans Merensky would have been proud to see the current huge investment in new mines exploiting the rich platinum reef he discovered in the Lydenburg area back in 1924. Although it has taken almost eighty years for the market demand to justify the projects, he would also have been impressed by the speed with which the mines are being developed using the latest technology. It is fitting that the remains of the old homestead, where this remarkable man grew up, look down on the site of one of the larger projects, Impala Platinum's Marula mine. A legendary geologist, mining engineer, humanitarian and conservationist, Merensky would also have approved of the greater efforts to share the benefits of these developments among the local communities and the concern shown for human safety during construction.**

A company that has been very involved with all of the current platinum mine projects in Limpopo Province, is Group Five. In the case of Marula, Group Five's civils, mining and industrial operation is close to completion on the materials handling system, which includes four reinforced concrete silos, the civils for the ore processing plant and the civils for the concentrator plant. The scope of work was similar for the Modikwa platinum mine (previously called Maandagshoek after the original agricultural holding) near Steelpoort, which is owned jointly by Anglo Platinum and the black empowerment mining group, African Rainbow Minerals (ARM). Group Five Civils has also completed the portals and decline shafts at Anglo Platinum's Hackney and Twickenham mines, where mining is already underway.

In October 2000, Group Five was the first contractor on the Maandagshoek site and had contracts valued at close to R180million for the civils and engineering construction of the Modikwa mine and processing plant. Using their own on site batch plant, the R40,4 million contract for roads, drainage, platforms, pipelines, culverts and decline shafts was completed in February 2001. With the R68 million contract for the main civils work for Modikwa's concentrator plant in progress and contracts to supply all of the concrete for Impala's Marula mine due to start the following year, the decision was made to restructure the concrete batching and supply arrangements.

Group Five had been offered the opportunity to participate in the black empowerment initiatives of the Anglo Platinum/ARM joint venture. Consequently, a new company, Dilokong Ready Mix, was formed by Group Five, Zimele, Thagaletswalo and Difagate. With the support of Anglo Platinum, ARM and the Modikwa mine, the empowerment venture was set up with the aim of being a fully-fledged commercial operation supplying readymix concrete to all the projects in the Lydenburg/Steelpoort region. Zimele is a subsidiary of Anglo American, set up to create empowerment and business initiatives. Thagaletswalo has various companies involved in it, while being predominantly community based. Difagate is a combination of community interest and Maroke Stone Crushers, a company owned by Johannes Mkwala who is now a director of Dilokong Ready Mix. A successful enterprise in its own right, Maroke had its origins in a brick making concern that he started in 1985, branching out into stone crushing in 1996.

Started in July 2001, Dilokong Ready Mix produced over 100 000m<sup>3</sup> of concrete in the first two years of its existence, representing a turnover for the company's batch plant of some R45 million. "Group Five's function was to provide technical and operational support to Dilokong," comments Deon van Rensburg of Dilokong Ready Mix. "We do the mix designs in the Group's concrete laboratory. From the beginning we decided to base them on a 70/30 CEM I/Dura-Pozz<sup>®</sup> fly ash mix for all purposes. This mix is not only cost-effective, but it is also versatile with many benefits.

The workability of the mix was important to us as well as the reduced heat of hydration when compared with a 100% CEM I. A Dura-Pozz<sup>®</sup> mix also gives a strong durable concrete that has a superior off-shutter finish. Most of the Dura-Pozz<sup>®</sup> is supplied from Ash Resources' Matla plant in Mpumalanga."

Designing a mix that would cope with the high ambient temperatures in the area of the platinum mines was particularly important. The average daily temperature is around 33°C and can often rise to 48°C in summer. "The 70/30 mix works well, giving us good workability and no problems," says Van Rensburg. "We had considerable experience with it on other projects such as phases 1 and 2 of the Mozal aluminium smelter and the Katse Dam in the Lesotho Highlands Water Project."

In an impressive fast track achievement, Group Five completed Modikwa mine in October 2002 and moved on to start building Marula. Meeting the quantities required was challenging. Dilokong's two batch plants, a dry batcher and a Karoo plant, frequently produced between 600 and 700m<sup>3</sup> of concrete a day. In summer the transport contractors had to deliver the concrete in a workable state after an average journey time of thirty minutes and, in the case of deliveries to Lydenburg, a two hour journey.

The 70/30 CEM I/Dura-Pozz<sup>®</sup> mix also worked well for the construction of reinforced concrete silos for the mines using the continuous sliding system. The sliding featured Group Five's patented hydraulic jacking method to elevate the sliding shutters and the Group's patented levelling technique. Three silos were completed at Modikwa and four at Marula using two teams working twelve-hour shifts. The round-the-clock working required good reliable coordination between the raw material suppliers, the Dilokong batch plant, the transport contractors and Group Five's construction teams. For the larger of the Marula silos, with an internal diameter of 18m and a wall height of 29m, the sliding teams achieved a lift of 2,6m per shift.

Apart from supplying readymix concrete to over 90% of the users in the Limpopo platinum mine region, Dilokong also has other mutually beneficial interactions with local mines to source aggregates. When the batch plant was first commissioned it used an aggregate sourced from the close-by Tubatse ferrochrome mine. As demand outgrew the availability of suitable grades of aggregate from Tubatse, a different type of arrangement was made with the Modikwa platinum mine. Dilokong took more onsite responsibility and installed a crusher at the mine to ensure grade and stock control of the aggregate for the batch plant. This arrangement has now evolved to the stage where Dilokong have two crushers on site and a contract to crush 60 000 ton per month of low grade ore for the mine.

Group Five is justifiably proud of another involvement in platinum. Under Anglo Platinum's leadership, safety in all aspects of the Modikwa mine project was pitched on a zero-tolerance basis and achieved excellent results. The Dilokong batch plant is considered to be part of the safety awareness system and is subjected to rigorous inspections. Dilokong, in turn, is held responsible for the safety standards of the transport contractors that it employs. Group Five's own teams earned a NOSA 3-Star rating six months after starting the Modikwa contract and an Anglo Platinum Gold Safety Award for 500 000 man hours without a lost-time accident. This was soon followed by the Platinum Award for 1 000 000 man hours without a lost-time accident. Group Five also earned a NOSA 5 Star rating in March 2003 for the Limpopo Platinum Mines. It was a great credit to all involved and a vivid example of what strong leadership from the top and genuine commitment can achieve.

Strong commitment by Dura-Pozz<sup>®</sup> supplier Ash Resources to consistent quality, product cost-effectiveness and reliable delivery service, also brought appropriate reward: "Dura-Pozz<sup>®</sup> has been used in the concrete for the mine shafts, the flotation plants, the mill bases, the bridges, the roads and the water treatment plants" says Group Five Civils' Van Rensburg. "In fact every single cube of concrete from Dilokong Ready Mix has Dura-Pozz<sup>®</sup> fly ash in it!"