

Unique project at Simonstown



Widening the entrance at the Simonstown Stillwater Harbour.

THE complex task of widening the entrance at the Simonstown Stillwater Harbour is being undertaken using tools available exclusively through Diamond Products, a specialist in the manufacture, assembly and sale of diamond tools and equipment for industrial applications.

Cape Town-based concrete cutting, coring and drilling company, Concrete Worm has been commissioned to undertake the unique project - which involves cutting away sections of large concrete walls - known as caissons - in order to extend the entrance of the harbour by 11 m. Con-

crete Worm managing director Peter Fink explains that the harbour entrance requires widening in order to create more space to prevent lateral movement of a new fleet of larger South African Navy submarines, which are brought to berth by four tugboats. "In order to widen the entrance of the harbour, the caissons must effectively be sliced into individual slices that are each 8 m wide and 15 m deep. This is a highly-specialised job that has only been undertaken in South Africa once in the past."

Due to the intricate nature of the project, Fink notes that Diamond Products was the only manufacturer in South Africa capable of meeting the high standards required for the task.

Diamond Products director Darryl Gray points out that through its authorised Cape Town distributor, Powerbase, the company has to date supplied Concrete Worm with a total of 135 m of Diamond Products Orange razor wire. "The 11 mm closed loop wire contains 40 diamond beads per metre, and is rotated at 28-m-per-second by a 37 kW 380 v machine. A 360-degree swivelling head allows for horizontal and vertical cutting with the wire."

Fink notes that the wire has exceeded all expectations to date. "Diamond Products' razor wire has proven to be far more efficient than we had anticipated, which has enabled us to cut at an average rate of 3.3 sq m-per-hour, as opposed to the industry-standard of approximately 2 sq m-per-hour."

Diamond Products co-director Brian Clark at-

tributes this success to exclusive ARIX technology - a process of controlled deposition of diamonds onto the substrate at predetermined positions. "The diamond grits are placed with precision into three dimensional patterns, ultimately ensuring the maximum performance of the tool."

Concrete Worm was commissioned to start work on the project in April 2011, and Fink points out that the original plan was to cut three slices off the caissons; however, a number of additional challenges have necessitated additional cutting.

"The caissons were originally built in the 1950s, and are traditionally floated out to the required location before being placed firmly into position by being filled with a mixture of concrete and sand. Caissons are usually filled with a higher proportion of sand, so that they can be easily-emptied when required. Upon closer inspection; however, we discovered that the caissons contained more concrete than anticipated. As a result, we could not merely empty the sand, but instead had to cut through considerably more concrete."

Fink notes that this additional concrete resulted in the slices each measuring between 100 sq m and 120 sq m, and up to 450 tonnes in weight. "Due to the size of these slices, we have to cut them into smaller pieces for logistical reasons, as the only way of removing them off-site is by attaching them to pontoons and floating them to shore. It has worked out more cost-effective and less risky by doing more cutting and less floating,

as the entrance to the harbour has strong currents between tides. If the pontoon carrying the concrete is caught in the tide, it can easily be washed away or hit the naval vessels."

Fink highlights the fact that five cuts have been completed to date; however, more may still be required. "We are still running on schedule despite the fact that more cuts may be required, thanks to the reliability of the Diamond Products razor wire, which has been consistent in cutting at faster rates per application. The first cut took 50 hours to complete; however, as the operators become more familiar with the equipment, that time has been slashed to 32 hours per cut. This excellent performance and reliability has provided us with the peace-of-mind in knowing that we can still complete the project by the scheduled deadline of July 2011, despite the additional workload."

Concrete Worm was established in 1996, and today employs 25 staff members who specialise in all diamond cutting applications for large-scale projects nationwide. Fink notes that the company felt the negative effects of the recession; however, he believes that the future is looking positive. "Concrete Worm was affected by the recession in terms of turnover and profit for 2009 and 2010, like many other players in the industry. However, this year has shown positive signs of growth, and I am confident that expansion is possible for the company in the years to come, as infrastructural investment continues to increase."