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Johnson Crane Hire Helps Gmc Repair Critical Cape Town Breakwater

Lifting solutions leader Johnson Crane Hire has assisted Guerrini Marine Construction (GMC) to successfully complete vital maintenance at Cape Town's breakwater – considered one of the most essential aspects of the infrastructure for the Port of Cape Town and the popular V&A Waterfront.

Johnson Crane Hire's Heavy Lift Division supplied one of its 400 tonne crawler cranes to lift and place some 155 concrete dolosse – each weighing 25 tonnes. The work was carried out for Transnet Port Authority on the 'spur' section at the southern end of the breakwater between March and November 2017, adding these dolosse to withstand the sea's action on the breakwater.

The purpose of the spur is to prevent the long-shore movement of rubble and debris from the adjacent cobble beach, which could get between the dolos units on the main breakwater and damage them through a powerful grinding action. The core and under layers of the spur are constructed of rock and concrete rubble, while the deck is closed off with a single layer of concrete blocks; its side slopes are protected with dolos units. The main breakwater – the central section of the breakwater – spans a distance of 500 metres and is protected on the seaward side by dolosse.

The northern section of the breakwater is a vertical wall, located in deeper water and without any armour protection on the seaward side. It spans 365 metres and comprises concrete block work and caissons. The whole breakwater structure is crucial for the safe entry of vessels into the port, as well as for berthing and operations in the port.

"One of the most challenging aspects of the project at the spur was to create a two metre trench underwater in the bedrock so that the first line – or toe – of dolosse would not move on the seabed," says GMC chief executive officer Adrian Guerrini. "We used a piling crane to chisel through the rock, and our tug dredged the broken material away. These activities were highly dependent on good weather, so the variable weather conditions – including the storms of June 2017 – made it difficult to work to schedule."

Guerrini says the choice of crane was perfect for the application, especially as certain days required the crane to cover substantial ground. It would have to move about 10 metres while carrying a 25 tonne dolos and 10 metres back to a pick-up point for the next unit.

“The crane was also able to manage the placing of the dolosse at the maximum distance of 38 metres to the underwater trench,” he says. “The mobility and productivity of the crane was a key factor in completing the project on time. We were able to move one dolos from the deck and into place in just one hour.”

Produced by precast concrete specialists Concrete Units, the dolosse were delivered to site at the rate of six per day, and were placed by the crane in a storage area. These were then lifted and placed in specified positions according to the layout design, with about a third of these below the water line.

According to Cornelis Grotius, general manager of Johnson Crane Hire Heavy Lift Division, the crawler crane was the ideal machine to undertake the lifting duties on this contract because of its mobility and strength, enabling it to move swiftly between installation positions as the project progressed.

“This type of project requires the lifting equipment to move efficiently from one position to another, so called for a higher level of mobility than can be offered by a mobile hydraulic machine,” says Grotius. “We chose the Kobelco CKE4000 from our fleet as it packs the necessary lifting capacity, and also offered the required reach.”

Among the advantages of the crawler crane is the stability achieved by the wide tracks spreading the weight out over a larger area, so it can operate without outriggers and can travel with a load.

Johnson Crane Hire is well established in Cape Town and operates a comprehensive fleet in this region; when necessary, its wide range of mobile cranes is supplemented from its other branches nationwide.

REPAIR PIC 01 : Johnson Crane Hire supplied one of its 400 t crawler cranes to lift and place 155 concrete dolosse at Cape Town's breakwater.

REPAIR PIC 02 : Johnson Crane Hire's 400 t crawler crane configured with a 48 metre lattice boom length and 120 tons of machine counterweight.

REPAIR PIC 03 : Johnson Crane Hire's 400 t crawler crane placing 25 ton dolosse at a 30 metre working radius.

REPAIR PIC 04 : Johnson Crane Hire's 400 t crawler crane lowering a dolosse.

REPAIR PIC 05 : A close up view of the Johnson Crane Hire 400 t crawler crane working on the Guerrini Marine Construction project at the Cape Town breakwater.

REPAIR PIC 06 : A close up view of the 25 t dolosse being rigged prior to lifting.

REPAIR PIC 07 : One of the 25 dolosse being rigged prior to lifting.

REPAIR PIC 08 : The Johnson Crane Hire 400 t crawler crane with its 120 ton of machine counterweight.

REPAIR PIC 09 : Rigging and lifting a 25 t dolosse at the Cape Town Waterfront, with Johnson Crane Hire's 400 t crawler crane.

REPAIR PIC 10 : Johnson Crane Hire's Kobelco CKE4000C positioned ready to place a 25 t dolosse at a 30 metre working radius.

REPAIR PIC 11 : Scuba teams ready to assist Johnson Crane Hire with the placing of the dolosse units, each weighing 25 t.

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