



Ngqura Harbour

The centerpiece of the Coega Industrial Development Zone in the Eastern Cape region is the new Port of Ngqura, a multi-user deep-water harbor, located some 25 kilometers north of Port Elizabeth at the estuary of the Coega river.

Ngqura Harbour Contractors (NHC), a joint venture of HOCHTIEF, Concor and Ngqura Empowerment Contractors, was awarded the maritime works contract in 2002 comprising operation of a quarry, construction of the harbor basin with quay walls as well as two breakwaters for protection. The port is providing berthing facilities for dry and liquid bulk carriers as well as container ships.

Quarry

The quarry covered an area of approximately 60 hectares and was located some nine kilometers away of the harbor site. All material generated, about eight million tons, was used either for armor and core material for the breakwaters or for aggregates for the production of concrete, produced by an on-site crushing plant. The concrete was used for the construction of quay walls, caissons, 30-ton dolosses and the capping of the breakwaters.

Harbor

The construction of the inner harbor basin and the quay walls required the excavation of some 13.8 million cubic meters of earth utilizing land-based earthworks plant. In order to achieve this an area of 300,000 square meters had to be dewatered down to 20 meters below sea-level, together with construction of a rockfill wave protection wall on the shoreline and a 1.2 kilometer long bentonite slurry cut-off wall also down to 20 meters below sea level.

Quay Wall

The five harbor berths, total length of 1.96 kilometers, were constructed as mass gravity, voided, concrete quay walls. Since all water was removed from the harbor, basin construction works could be done in a dry construction pit using conventional construction methods.

Project Data

Client:

National Ports Authority of South Africa
P.O. Box 162
Port Elizabeth, 6000

Contractor:

Ngqura Harbour Contractors JV
composed by
HOCHTIEF Construction AG, 76%,
technical leader
Concor Ltd., 14%, commercial leader
Ngqura Empowerment Contractors, 10%

Main quantities:

Quay walls	1.96 km
Eastern breakwater	2.7 km
Western breakwater	1.1 km
Dolosses	25,660 each 30 t
Excavation	13.85 million m ³
Concrete	765,000 m ³
Formwork	378,000 m ²
Reinforcement steel	9,000 tons
Quarry exploitation	8,000 million t/ approx. 4.2 million m ³

Order value:

ZAR 1.7 billion / EUR approx. 170 million
Measured contract

Construction period:

September 2002 to January 2006

Breakwaters

Two breakwaters protect the harbor. The primary or eastern one is 2.7 kilometers long and reaches a maximum water depth of 18 meters. The secondary or western one is 1.1 kilometers long and reaches a water depth of maximum 15 meters. Both are constructed onshore and comprise a bulk rockfill core with a secondary wave protection using armor rocks from three to six tons in weight. Primary wave protection is provided by 30-ton dolosses. The breakwaters are topped with a concrete capping and seawalls at about six meters above mean sea level. The breakwaters are anchored at the seaward ends with concrete caissons. Challenging feature during the construction period was the general rough sea with strong waves.

Dolosses

In a special dolosses yard about 50 dolosse had to be fabricated per day around the clock. These were transported to the breakwater by heavy duty trailers after 28 days for curing and placed offshore by huge

high-tech cranes, approximately one dolos every ten minutes, with help of the GPS system for positioning, allowing an accuracy of three centimeters.

Submerged Caissons

These were cast in the inner harbor basin and floated into place after flooding of the basin and positioned at the ends of the breakwaters.

Black Empowerment

An important aspect of the project was for the construction works to provide opportunities to the previously disadvantaged community in South Africa. In pursuing their Black Economic Empowerment (BEE) objectives, NHC committed in excess of 450 million Rand worth of work to their partners, subcontractors and suppliers who qualified for BEE status. In addition the project provided significant opportunities within the local communities for direct employment and training, not only in construction activities but also in business administration and related fields.

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