

# Project

## Concrete repairs Zuetina Jetty, Libya

Built originally in 1968 by an US contractor, the northwest breakwater and jetty at the Terminal of Zueitina Oil Company (ZOC) were up for repairs in 2007. The concrete piles of the north jetty and the west breakwater as well as the capping beams and the parapet wall showed serious signs of deterioration and severe cracking. In order to ensure the future safely operations of the jetty proper repairs had to be conducted. The contract was awarded to Interbeton Libya, branch office of BAM International bv.

Earlier adaptations and maintenance of the jetty include an extension by the original builders in 1969 and a complete renovation of the approach trestle and repairs on the concrete deck of the north jetty by Interbeton in 1990.



<b>Location</b>	Zueitina Terminal – Libya
<b>Client</b>	Zueitina Oil Company (ZOC)
<b>Contractor</b>	Interbeton Libya bv
<b>Contract period</b>	April 2007 – December 2008
<b>Contract sum</b>	€ 8,5 million

*'BAM International's specific knowledge of and experience in concrete repair technology has resulted in extending the life time of the jetty and breakwater for many years'.*

The repair job of 2007 consisted of the following activities:

- The complete repair of more than 700 pre-stressed tubular concrete piles divided over the north jetty, west breakwater and west breakwater extension.
- The repair of 25 m<sup>2</sup> of the parapet wall, located on the outer side of the harbour.
- The repair of 110 m<sup>2</sup> of the parapet wall, located on the inner side of the harbour.
- The complete repair of 225 m<sup>2</sup> of the deck, located on the intersection of the north jetty and the west breakwater.
- The capping of the existing concrete tie-beams on the west breakwater and west breakwater extension by pouring a concrete jacket around the in situ tie-beams (total length 650 m).

#### Extra work carried out

- Repair work of another 100 piles against a higher standard.
- Repair of an additional 400 m<sup>2</sup> of the parapet wall on the inner side of the harbour.
- Repair of an additional 17 m<sup>2</sup> of the parapet wall on the outer side of the harbour.
- Pouring of a concrete ramp to create access in front of the marine building and to create access to the west breakwater extension.

#### Shotcreting

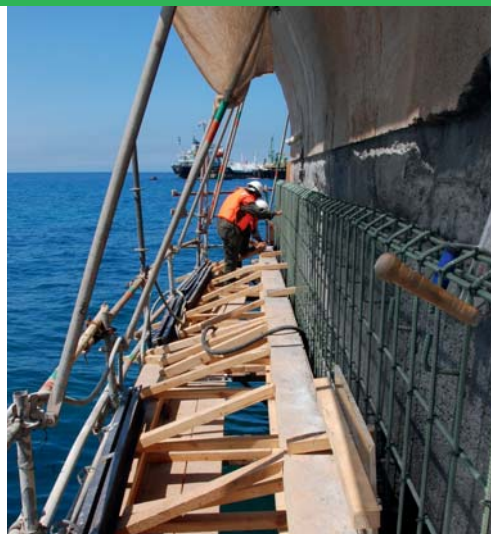
The demolition of the existing, deteriorated concrete was done by means of a high-pressure hydroblasting machine (2500 Bar) and the pile repairs were executed by means of shotcreting.

The shotcreting technique was rendered by an affiliated company BAM Betontechnieken bv, who are very much specialized in this field of services. The work was executed between May 2007 and December 2008, which period is inclusive of all the additional work.



Shotcreting the piles

Hanging platform  
for jacketing the tie beam



#### The repair of the piles, three categories:

- Group 1 - Preventive maintenance by painting the exterior of the piles from the waterline up to connection of the tie-beam.
- Group 2 - Small patch repairs by means of shotcreting.
- Group 3 - Complete structural repair by filling hollow piles with structural concrete and shotcreting of the pile surface.

Finished piles after coating



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