

# HYDRONAV

## BREAKWATER CONSTRUCTION INDIA

**Location:** Gulf of Khambhat, INDIA

**Date** : January 2002

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**Background.** A leading Singapore marine construction contractor was awarded a contract to construct a breakwater in the Gulf of Khambhat, Northwest India. The breakwater would be constructed using tetrapods and rocks at a location approximately 2.5km offshore. The breakwater would be approx. 700m in length and located in 21 meters of water depth. Tidal range would be approx. 9 meters with strong currents of up to 7-8 knots.



The contractor proposed to use three(3) splitter barges to transport the tetrapods and rocks offshore. Two(2) construction barges would be used with CCH1500E 150 tonne cranes to place the tetrapods and rock and for dredging works. An accuracy of 100mm was specified for position and depth monitoring during such work.

A hydrographic survey boat would be used for routine daily/weekly surveys to independently monitor the progress of the construction work.

### Construction Barge & Crane

**Solution.** HYDRONAV SERVICES was contracted to supply an integrated solution for the above survey/positioning requirements.

The use of the TRIMBLE MS860 Real time kinematic(RTK) GPS was chosen for position, heading and height monitoring to centimeter accuracy on each construction barge and also a second MS860 located on each crane to determine position, heading and height.

A PROLEC Dredgemaster system was selected to monitor cable pay-in/out to centimeter resolution between the clamshell and the top of the boom of the crane where one of the RTK GPS antenna were located providing centimeter accurate heights at 20 Hz.

The TRIMBLE HYDROpro construction software was selected for interfacing all the above equipment to and customising position and profile displays both in graphical and textural format of the clamshell position/depth relative to the design profile for the project to centimeter resolution.

A survey boat was installed with a survey grade ODOM Hydrotrac echosounder with TRIMBLE MS750 RTK GPS receiver and HYDROpro navigation software for acquisition of sounding data. HYDROpro TERRAMODEL software was selected for office processing and generation of cross-sections, longsection and general charting with CAD and design capability for channel design.

The DAVID VYNER tide gauge was selected to monitor tide level and to cross check the RTK tide files generated from the TRIMBLE RTK GPS receivers.

A VALEPORT 105 current meter was deployed to monitor the current speed and direction during the construction work.