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Fourth Oil Berth at Butcher Island, Bombay

Installation de chargement de pétrole à Butcher Island, Bombay

Die vierte Verladestelle am Butcher Island, Bombay

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1. GENERAL FEATURES

The Fourth Oil Berth at Butcher Island in Bombay harbour caters to oil tankers of 125,000 DWT berthing in deep waters. The mooring face consists of 11 circular caissons and is connected to land through a 1.8 Km long jetty. About 380 m of the jetty is with an earthen bund and the remaining length is on pile bents. The tidal range in the area is about 4.5 m, water current has speeds upto 2 m/sec. and water depths range upto 20 m. The project is notable for the construction techniques adopted to suit the difficult site conditions.

2. CAISSONS

There are totally 11 circular RCC Caissons having diameters upto 17.6 m and about 25 m height. They were precast with a raft base slab in a dry dock about 7 Km away and brought to site towed by tugs over sea. At the location a rubble mattress was prepared beforehand by dredging the sea bed, dumping graded rubble and levelling it using a screeding beam. Once the caisson was at the location, water was filled up inside for ballasting and the caisson sunk in position followed by filling up inside with sand for stability. The superstructure is then built-up in-situ. The caissons include pier-head, berthing, approach and mooring caissons. The various caissons are connected by steel trusses supporting walkways.

3. PILED JETTY

For the jetty hollow precast concrete piles as well as M.S lined piles were used. Piles of 0.95 m and 1.4 m diameters socketed into rock and of length upto 25 m were adopted. The two-pile bents are generally at 12 m centres. "Strong-points" were created at regular intervals with more closely located fixed-base piles and the other piles were treated as hinged-base piles. Precast pile muffs were placed on top of the piles which were temporarily braced together till final geometry was achieved and the joints concreted in-situ. Precast longitudinal girders were simply supported between the pile muffs and the deck slab was cast in-situ. Two different sets of equipment were used for piling - a Piling Pontoon for use in deep waters and a Piling Platform for proceeding from the shore in shallow waters supported on the completed piles.

4. CONCLUSION

A project of this magnitude involving precasting and placing in position in sea large elements and installing a large number of piles in sea demonstrates the competence of Indian Construction Industry adopting indigenous technology in marine field.

The owners of the project are Bombay Port Trust and the contractors were M/s. National Building Construction Corporation assisted by M/s. Christiani Nielson. M/s. STUP Consultants Limited provided design and construction consultancy to the contractors.



Fig.1 Caissons precast in dry dock



Fig.2 Caissons being towed in sea

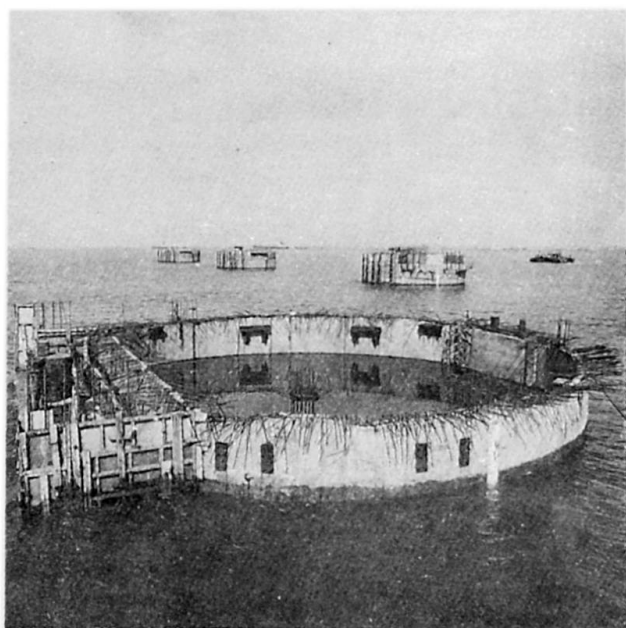


Fig.3 Caissons in position



Fig.4 Piled Jetty