

# DEVELOPMENT OF THE PORT OF CUDDALORE HYDRAULIC MODEL STUDY

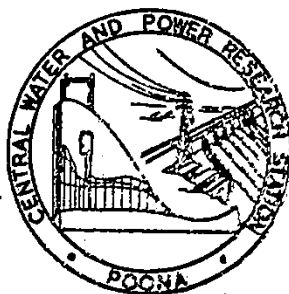
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## PREFACE

The natural growth of ports along the east coast of India is inhibited due to heavy sand drift caused by breaking of waves at an angle to the coast. The south-western waves, which predominate over the north-eastern waves, both in strength and frequency, are mainly responsible for the enormous sand movement along the coast. The net littoral drift is, therefore, from south to north. Activities of the Port of Cuddalore, one of the most important intermediate ports on the east coast and situated about 120 miles south of Madras, are hindered due to this intense littoral drift. The depths at the entrance to the port deteriorate while the entrance itself moves towards north over a distance varying between 3000 to 4000 ft (914.4 to 1219.2 m) in a period of about 8 to 10 years. The entrance is not allowed to occupy a position close to the light house on account of latter's safety, and an artificial cut is made on the south side to divert the flow.

In order to develop the port it was necessary to stabilise the entrance and maintain adequate depths in the entrance channel. Experiments were conducted in a hydraulic model to length and depth scales of 1/200 and 1/50 to study various proposals. Two layouts for maintaining 9 and 17 ft (2.74 and 5.18 m) depths below LWOST in the navigation channel during first and second stages of development respectively have been recommended. First stage envisages construction of breakwaters 1300 and 900 ft (396.24 and 274.32 m) in length on the southern and northern sides of the gut respectively and sand trap behind the southern breakwater. It has been suggested that breakwaters for the first stage might not be extended in the beginning of the

second stage of development. Instead, only a sand trap may be extended upto 17 ft(5.18 m) contour in the sea, and periodic dredging carried out in the sand trap. Extensions of breakwaters to the final lengths of 1900 and 1700 ft(579.12 and 518.16 m) of the southern and northern breakwaters respectively, might be carried out in stages after watching conditions in the prototype in regard to silting in the entrance channel.

These investigations brought to light the following points :

i) An effective way of dealing with littoral drift consisted of obstructing it in a sand trap and dredging and dumping it on the down-drift side.

ii) An entrance channel if inclined in the direction of predominant littoral drift functioned better than the one at right angles to it.

iii) Vertical type of breakwater was not considered suitable in this case as the wave disturbance was continued in the navigation channel. It was further subject to very high dynamic pressures due to the location of the breakwater in shallow waters.

The investigations were carried out at the instance of the State Port Officer, Madras. The permission kindly granted by the Ministry of Transport, New Delhi, to publish the memorandum is gratefully acknowledged.