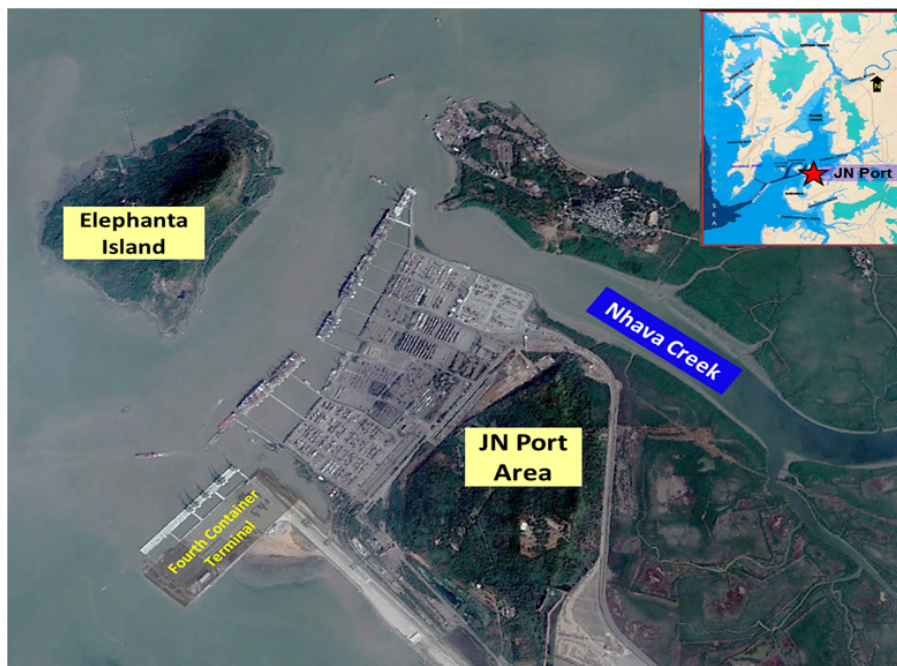


## JAWAHARLAL NEHRU PORT, MAHARASHTRA

### Background

The Jawaharlal Nehru Port (JNP), a natural major port of India, is situated in Thane creek on the west coast of Maharashtra. The development of JNP was proposed as the port of Mumbai got congested due to significant increase in vessel traffic by mid 1970s. The location for port in front of Elephanta Island near Nhava-Sheva creek in Thane creek was identified such that the natural deeper depths in channel are available with minimum expenditure on capital dredging and no construction of breakwater was required for wave tranquility. The port facilities are being developed in stages to cater to the increasing demand of container traffic and presently it is the premier container port of India handling about 4.8 Million TEUs containers/annum. The depth of 14 m below CD is maintained by port as Phase-I deepening in main channel to allow smooth entry of 5th generation container carriers with the aid of tidal window. The Phase-II deepening of channel up to -16m is in progress. JNP has recently completed development of 2 km long mega container terminal known as Fourth Container Terminal (FCT) to increase its container handling capacity up to 10 Million TEUs.



### Overall View of Jawaharlal Nehru Port

### Studies Conducted

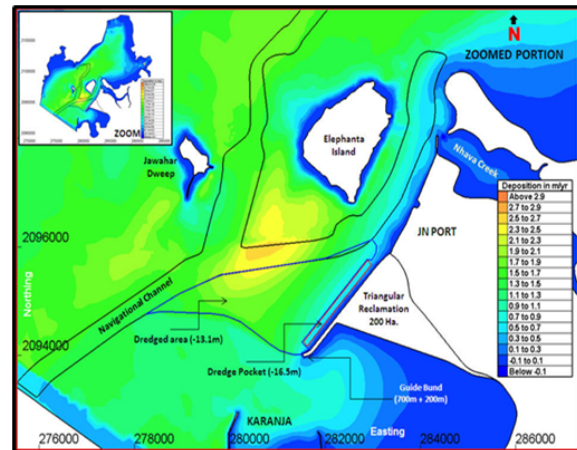
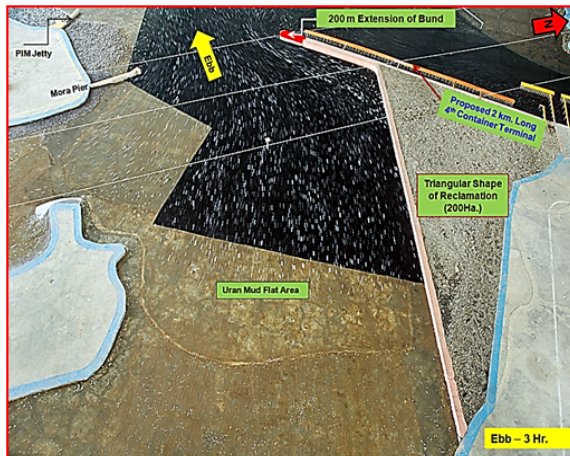
The well calibrated physical tidal model of the Mumbai Port constructed to a scale of 1:400 (H) and 1:80 (V) at CWPRS in association with mathematical model (Telemac software) are in use to study the various developments under consideration.

- More than 50 model studies including field investigations were carried out by CWPRS for JNP since its inception.
- Studies for Master plan development for the expansion of port were also carried out.
- Aspects such as alignment of jetties/berths, effect of shape of reclamation on the surroundings, alignment of navigational channel, design of channel cross sections etc, were studied and finalised to achieve safe navigation and berthing/de-berthing of shipping vessels at JN Port.
- The optimal alignment/length of guide bund to achieve desired flow conditions at container terminal proposed at the confluence of Nhava creek and Elephanta Deep was evolved considering the effect



of reclamation in Nhava creek.

- The estimation of likely rate of siltation in navigational channel, berth pockets etc. to assess quantum of maintenance dredging was carried out using mathematical model.
- Since the capital dredging of main channel up to (-)16 m below CD was proposed by JNP in two phases, wherein the dredging quantity is about 85 Million m<sup>3</sup>, the locations for disposal of dredged material were finalised based on the dispersion studies carried out using mathematical model.

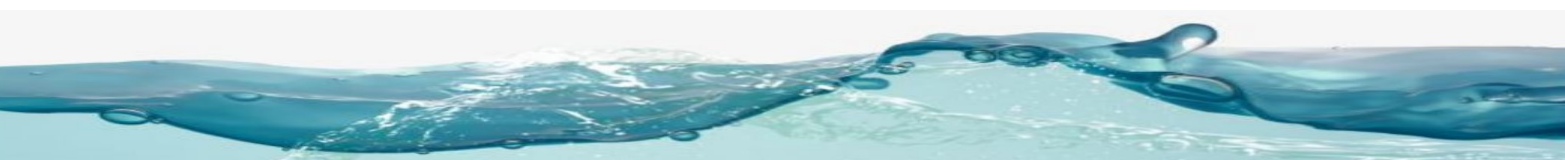


#### Effect of Reclamation on Flow-Physical Model (FCT)

#### Estimation of Siltation- Mathematical model (FCT)

#### Outcome and Benefits

- The CWPRS studies provided optimum alignment/orientation of berths and navigational channel as well as effect of proposed developments on nearby waterfront structures.
- The dispersion studies provide environment compliant viable location of dumping grounds for the safe disposal of dredged material resulted from capital and maintenance dredging.
- The alignment & orientation of guide bund at the confluence of Nhava creek and Elephanta Deep wherein complex hydrodynamic flow conditions prevail was evolved to develop a new container terminal and it also allows safe movement of fisher folks in and out of Nhava creek.
- Recently, alignment of 2 km long mega container terminal along with suitable shape of 200 ha reclamation was evolved to have negligible impact on nearby waterfront facilities as well as to achieve smooth operability of container ships round the clock/year all along the entire berth length.
- The layout of various berths finalised through model studies carried out at CWPRS and constructed at JNP are operating smoothly without any interruption and the Port has achieved number one position in India in handling container traffic.
- No adverse impact of development is reported on surrounding area from morphological considerations.
- This has resulted in significant contribution of the Port in economic growth of the country by way of increase in export/import of goods.
- In near future the port will handle about 10 Million TEU container traffic at JNP.





***Panoramic View of Jawaharlal Nehru Port***

