Safety and Operation Management Considerations for Port-Island Coastal-Protection Works

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ABSTRACT
An alternative approach such as the construction of port-island is popularly considered in port development. This paper discusses the present practice of safety and operation management involved in port-island coastal-protection works. The tool-box-meeting (TBM) method for safety management and the implementation and monitoring responsibilities of the safety control are defined in this paper. The completed project has met all the allowable standards and specifications set for marine construction. The optimization of construction schedule is analyzed by considering the labor utilization factor (LUF). Lastly, common problems encountered during the construction phase of the project and corresponding countermeasures are considered in this paper.

KEY WORDS: port-island, coastal-protection works, labor utilization factor, safety management, marine construction

INTRODUCTION
A sound economic development of coastal area and waterfront depends largely on effective port development. Space and warehousing costs are increasing because of the great demand in ship investment, port-handling, cargo-handling; thus, conventional port locations and operations are very difficult to manage. To meet the increasing demands, construction projects such as the reinforcement of container facilities and development of waterfront are being initiated. In Japan, an alternative approach such as the construction of port-island for port developments is popularly considered. A 379.4 hectare port-island project is being constructed in four stages at Nagoya Port. The north area, the first two stages which covers an area of 211.7 ha, of the high tide breakwater has already been reclaimed using earth and sand from dredging. This is to be used as a cargo-handling site in the future. The ongoing third-stage project has an area of 90.1 ha.; whereas, the last stage of port-island project covers an area of 77.6 ha.

The Port of Nagoya has been exerting great efforts in expanding the sphere of its function as an international trading port. This port links to more than 200 major ports around the world via regular foreign-trade navigation routes and plays a significant role as the sea entrance to the Chubu economic region. Basic commodities are imported everyday in containers through the Port of Nagoya; and, products manufactured locally such as automobile parts, television sets, sewing machines, and ceramic wares are exported also through these shores. The amount of container cargo is expected to increase even further in the future; thus, an establishment of a long-range alternative scheme with a very efficient transport system, deep-draft berths, spacious container yards, and advanced information processing capabilities is deemed necessary. This paper explains the present practice on safety and operation management for port-island coastal-protection works.

WORK DESCRIPTION
A part of the third-stage project of the coastal-protection works contract was awarded to Wakachiku Construction Company Limited (WCCL) by the Fifth District Port Construction Bureau (GOKEN). Figure 1 gives the plan and section views of the ongoing coastal-protection works for the port-island project. The duration and amount of works is shown in Table 1. The site of the coastal-protection works is 250 meters away from the west-side navigation channel; thus, constraints relating to traffic flow during construction are considered. Moreover,