DETAIL ENGINEERING DESIGN ‘CONVERSION FROM BULK AND CARGO TERMINAL INTO BULK AND CONTAINER FREIGHT TERMINAL’ AT NILAM TIMUR TERMINAL – PORT OF TANJUNG PERAK SURABAYA

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Abstract

Conversion of Nilam Timur Terminal to be aimed for solving the problem that happened in port of Tanjung Perak Surabaya is to increase service capacity of container freight loading and unloading. The terminal which has loading/unloading dock with caisson as foundation, this later will be provide with equipments of modern technological operational.

The objective of this detail engineering design conversion study is to get the most efficient detail of the dock that the most efficient. Study definition in this final project didn’t do master plan study for port of Tanjung Perak, calculation for internal stability of caisson, the problem of dredging and design ship plan is 17,000 DWT. The methodologies used in this final project are secondary data analysis, layout evaluation, design of new structural elements, design of the container yard pavement, evaluation in external stability of caisson, compiling the construction method of the terminal, cost analysis and making conclusion.

The concept of detail engineering design of container freight dock in Nilam Timur Terminal is uses elastic (alternative) method as following the newest code namely is SN103-2847-2002. From the result of detail engineering design of Nilam Timur dock which has total wide about 135 m and 415 m total length uses fender with bridgestone SUC1000H-R1 type, while the bollard that used for the dock is has 100 ton in capacities.
with diameter 45 cm and AMB-100A type. Thickness of the slab is 40 cm, the dimension of transverse and longitudinal beams is 50 cm x 70 cm, the dimension of crane beams is 70 cm x 150 cm supporting by spun piles 050 cm which attached every 2,5 m with required depth is 52 m for land side and for sea side use transfer beam 60 cm x 90 cm which attached every 2,5 m. Result of the calculation external stability of caisson shows safety factor more than the requirement for all stability control that have been done such as overturning stability, horizontal displacement stability, bering capacity, sliding stability and settlement control.

Paving Block is used for container yard pavement system with surface course in 8 cm thickness and the minimum compressive strength is equal to 45 Mpa, the thickness of base course with CTB is 55 cm and has minimum compressive strength equal to 12 N/mm2 and for the sub grade course is assumed have CBR 20%.

The construction method that use for build Nifam Timur dock is replace the existing dock with new dock structure. The result of cost analysis is the cost that should prepared for build and repair the dock is Rp. 63,790,260,000,00,-

Keyword : dock, caisson, container yard