UNIVERSITAS INTERNASIONAL BATAM

Faculty of Civil Engineering and Planning
Department of Civil Engineering
Odd Semester 2019/2020

Designing Structure for Wharf with 20.000 DWT Capacities

DANIEL SABAR MENANTI HUTAPEA
NPM: 1611005

ABSTRACT

Wharf is a facility of a port that used for mooring ships and loading or unloading goods or passangers. PT. Paxocean is a company in shipyard field and marine engineering located in Batam. PT. Paxocean is now designing and will construct wharf for particular purpose only. The wharf length is 300m and will used for repairing ship with length overall till 280m with draft 5m. Based on bathymetri, the seabed is at level -8m.

In this thesis will studied and designed about the structure of the wharf comprise slab, fender, bollard and sheetpile. The structure is calculated by analyzing the loading and compute the maximum moment from ultimate loading. The steps to analyze the loadings are collecting data and design input from owner. The slab is considered to hold live load 2 t/m^2 and supported by piling foundation system. The slab is designed by 300mm thick with rebar D20-200 two layers to hold the loads. The fender system is considered to bear berthing force of ship. The berthing force occurs by calculating the energy of ship with velocity 0,15 m/s. The berthing force is 77,06 ton. The fender system is using UE-800 Trellerborg with capacity 119,61 ton. The bollard is considered to resist mooring force. The bollard is designed by using composite pipe 12mm thick with 600mm inner diameter to resist mooring force 500 kN. The capacity of the steel pipe bollard is calculated 2304,56 kN. Sheetpile is considered to resist soil active pressure. The moment of the soil active pressure works at the sheetpile is 315,7 kNm. Sheetpile KSP IIIA is designed to resist the moment. The widerstand moments is 1503,53 cm^3. The section modulus of sheetpile KSP IIIA is 1520 cm^3. The sheetpile KSP IIIA is afford to resist the soil active pressure.

Keywords: *wharf, slab, fender, bollard, sheetpile*