

DEPARTMENT OF MARITIME AND TRANSPORT TECHNOLOGY

Type of assignment: Designing Dredging Equipment
Assignment number: 99.3.GV.????
Confidential: No
Date: 13 August 2007
Name student:
Course of study

Title: The design of a heavy duty Backhoe Dredger (BHD).

Consideration:

A dredging contractor considers to replace his obsolete bucket ladder dredger by a backhoe dredger.

From market studies it appeared that:

- The 50 % of the time the backhoe will do maintenance jobs in soft soils; 30% in blasted rocks and 20 % in unblasted rocks of 10 Mpa. Compressive strength.
- The minimum production in soft soil should be 450 m³/hr.
- The existing water depth varies between 0 and 18 m
- Required dredging depth varies between 3 and 18 m
- 20% of the work is unprotected; the wave climate is for the gulf area

From you is requested a conceptual design of a Backhoe Dredger suitable for executing the above mention dredging jobs.

A. Starting points

- A.1. Lecture notes “Designing Dredging Equipment”, WB3408
- A.2. Ports & Dredging (IHC)
- A.3. Dredgers of the World
- A.4. Global Waves Statistics.
- A.5. Other relevant literature

B. Assignments

- B.1. Determine the required cycle time of the BHD to fulfil the production requirements in soft soil.
- B.2. Design the required dredging installation. (Bucket size, required excavation forces, cylinder forces and diameters and pressure, rotating power of the crane, required diesel power, auxiliary power, etc.
- B.3. Draw up a power balance for the different parts of the dredging cycle

B.4. Determine the main dimensions of the pontoon (L,B,H,T)

B.5. Design the required spud systems.

B.6. Give a main layout of the dredger.

B.7. Report in English the sub assignments B.1. t/m B.6

C. Supervision

This assignment should be independent executed by the students mention above.

For questions, remarks and assistance contact Prof. Vlasblom via E-mail address: W.J.Vlasblom@wbmt.tudelft.nl. For making appointments with Prof. Vlasblom please contact Mrs. Bokop van der Stap, telephone 015 2786529.

D. Time

This assignment starts at.....and have to be finished in a maximum of 4x80 effective hours, including the reporting. Besides the enclosures the size of the report shall not exceed the 50 printed pages and starts with a signed assignment and a summary of maximum 2 pages.

E. Confidential agreement

Not applicable.

Agreed by:
The student

The Chair of Dredging Engineering

Prof.Ir. W.J. Vlasblom