

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 Multi Purpose Trailing Hopper Suction (TSHD)

Consideration:

Maintaining the Dutch North Sea Coast the Dutch ministry of transport (RIJKSWATERSTAAT) frequently uses the technique of foreshore sand supplies. On sensible areas along the coast sand the seabed level is increased to -5 m (NAP) by means of dumping sand loads from trailing suction hopper dredgers.

A Dredging Contractor considers buying a new trailing suction hopper dredger.

From market studies it appeared that:

- The yearly sand supply to the Dutch Coast is Mm^3 ¹
- Sailing distances from burrow areas to the reclamation areas vary between nautical miles.² The mean particle size of the sand in those areas varies between 200 μm . The existing dredging depth in the burrow areas varies between 20 and 30 m
- The wave climate in the burrow areas is unprotected for North Sea waves.

From you is requested a conceptual design of a trailer Suction Hopper 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

¹ Contact RWS Department North Sea in Rijswijk

² Same

- B.1. Determine the average payload per trip for the TSHD to design, based on an assume distribution of the sailing distance and the particle sizes
- B.2. Determine the main dimensions of the vessel (L,B,H,T) and the hopper.
- B.3. Design the required dredging installation. (Number of dredge pipes, pipe diameters, pump capacities and manometric pressures of the dredge and jet pumps, specific speed of the pumps, pump powers, maximum dredging depth, etc)
- B.4. Draw up a power balance for the different parts of the dredging cycle. (Dredging, sailing unloading)
- B.5. Design the required unloading systems.
- B.6. Give a main layout of the dredger.
- B.7. Give a possible cross section of the main frame.
- B.8. Report in English the sub assignments B.1. till including B.7

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. Besides the hard copy, a digital copy (CD rom) of the report have to be handed over.

E. Confidential agreement

Not applicable.

Agreed by:
The student

The Chair of Dredging Engineering

Prof.Ir. W.J. Vlasblom