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 an offshore Gravel Dredger

Consideration:
Due to environmental constrains opening of inland new gravel pits for industrial purposes becomes more and more difficult. An option for the lack on sufficient gravel is to import gravel from sea sources. However, the gravel from these sources is mixed with sand, so on board screening of the row gravel is a requirement.
Therefore an International operating Dredging Contractor considers ordering of a gravel dredger.

From market studies it appeared that:

- The yearly production capacity of the new gravel dredger should be at least 2 million tons.
- Sailing distances from burrow areas to the Dutch harbours vary between 75 and 100 nautical miles. The existing dredging depth in the burrow areas varies between 40 and 75 m
- The wave climate in the burrow areas is unprotected for North Sea conditions.

From you is requested a conceptual design of a Gravel 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

B.1. Determine the average payload per trip for the Dredger to design, based on an assume distribution of the sailing distance and the particle sizes

B.2. Design the required unloading systems.

B.3. Determines the weight of the screening and unloading equipment

B.4. Determine the main dimensions of the vessel (L,B,H,T) and the hopper.

B.5. 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.6. Draw up a power balance for the different parts of the dredging cycle. (Dredging, sailing unloading)

B.7. Give a main layout of the dredger.

B.8. Give a possible cross section of the main frame.

B.9. 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