



Classification of soils and rocks for the maritime dredging process

1. Historical background

In 1972 an International Study Commission produced a report on the "Classification of Soils to be dredged" (Bulletin No 11, Vol1 ,1972). The report included recommendations to procedures for identification, general classification, sampling and testing of soils and rocks.

In 1984 PTC II proposed a revision of the report prepared in 1972 (Bulletin No 47, 1984). It presents a clearly structured, but limited overview of a classification of soils and rocks generally based on the British Standards (BS 5930), related laboratory and in-situ testing and sampling procedures.

The report concentrates on the dredging process, i.e. the process of loosening/cutting soils and rocks.

Most of the information is presented in tables reducing the size of the report to a handy document of only 14 pages.

2. Objective of the study

Although the objective and the setup of the report may not have to been changed, more recent views, knowledge and developments justify a revision of the report. Moreover, the booming of the dredging industry requires recommendations for the complete dredging process. So not only the dredging performance should be considered but also the hydraulic transport and the suitability of the dredged material as a fill.

This calls for an international uniform system of classification of soils and rocks.

3. Earlier reports to be reviewed

PTC II-report: Classification of soils and rocks to be dredged.

4. Matters to be investigated

The dredging process usually comprises four main stages:

1. *excavation*, comprising the loosening, fragmentation or cutting of the soil or rock
2. *raising* the excavated material to the surface by hydraulic or mechanical methods
3. *transport* of the excavated material to a reclamation or disposal area
4. *disposal* or use the dredged material.

One of the following types of equipment is typically employed for the first and second stages:

- Trailing suction hopper dredger.
- Stationary suction dredger.
- Cutter dredger.
- Dredging mill.
- Grab on pontoon on or vessel (with or without hopper).
- Backhoe on pontoon or on vessel (with or without hopper).

The third stage (transport) does not require additional equipment when a hopper dredger, or other vessel capable to transport the dredged material, is used. In case of stationary dredgers, this stage may require separate (hopper) barges, berthing alongside the dredger, or pipelines in which the material is transported as a soil-water slurry.

The fourth stage (disposal) may be done using bottom doors (hoppers), pumps, specially shaped pipe-ends (sometimes onshore; sometimes attached to a special pontoon), grabs or other equipment.

The choice of dredger type and the other equipment depends to a large extent on the soil and rock characteristics.

The main objectives of the working group are to establish:

- the physical and mechanical properties of the materials that influence the dredging and transport processes.
- the suitability of materials for land reclamation.
- the physical and chemical properties of the materials with respect to the transport processes and/or fill at the deposition.

Environmental aspects are beyond the scope of this working group.

5. Suggested final product of the Working Group

The report should propose a detailed classification of soils and rocks with recommendations for clients, consulting engineers and contractors involved in dredging projects.

As the handy size of the 1984-report was very much appreciated by the users an attempt to the same volume should be made.

6. Desirable disciplines of the members of the Working Group

The Working Group members should represent the different parties involved in dredging projects: clients, consulting engineers, contractors and shipbuilders. Furthermore a close cooperation with the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and the International Association of Dredging Companies (IADC) is of the first importance.