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## 6. Project and construction management

### Introduction

When it was decided in 1974 to modify the proposal to dam the Eastern Scheldt and build a storm surge barrier instead, the Government considered it desirable to enlarge the "DOS" contracting consortium by adding to it a number of firms experienced in concrete-construction work. As a result, a new consortium – Dosbouw – was formed and was closely associated with the barrier project from the beginning, including the design. This had the major advantage that it was possible for designers and constructors to exchange ideas from the outset. It also meant that conditions concerning technology, time and money were monitored jointly.

In this article the general set-up will be explained from Dosbouw's point of view, with particular reference to the following:

- the structure of the contracting combine (Dosbouw);
- the relationship between Government and Dosbouw;
- preparations;
- implementation.

### Structure of the contracting combine

Dosbouw is a consortium in which seven of the Netherlands' largest construction firms participate. (There were originally eight but Volker and Stevin subsequently merged with one another.)

Dosbouw was given the contract by the client, the Government, to build a storm surge barrier in a form which had yet to be decided. Dosbouw relationships with the partners in the consortium and the main features of its internal structure are indicated in Fig. 1.

In general, Dosbouw's staff consist of employees of the partners; some of the general and administrative personnel are recruited locally. Through committees and advisors the management can call upon the assistance of specialists without having to absorb them into the organization itself. In order to keep the number of staff at head office at Burghsluis down to about 250, some of the work is allocated to one of the individual partners.

The number of personnel employed under collective labour agreements is now about 1,500 (in 1981/1982).

Technically speaking, there is a fairly clear-cut demarcation between hydraulics and civil engineering. The first category comprise construction at/or below water level; concrete construction work belongs in principle to the second category.

Of course, there are border-line activities which could be classed as both, for instance installing the piers in the final closure gaps is classed as hydraulic, whereas the driving of the anchor piles in the openings is civil. The excavation work in the construction dock, whether underwater or not, is again classed as hydraulic engineering.

### Relations between Government and Dosbouw

There are of course close relations between the Department of Public Works and Dosbouw, various aspects of which can be distinguished as follows:

- contractual aspects;
- technical aspects;
- general supervision of the construction of the barrier;
- aspects of implementation of the project.

### Contractual

Under a master contract between the Government and Dosbouw, the latter undertook to build the storm surge barrier (the design of which still had to be worked out) to be operational by not later than 1985. The master contract includes directives for the subcontracts for the various sections of the projects which are already to be carried out. The contracts are based on specifications and drawings and on working methods mutually agreed upon by the contracting parties.

Before a subcontract is signed, the Government and Dosbouw both prepare independent estimates, though there is a common basis in that both sides have reached prior agreement on methods and plant. If the two estimates are not too far apart, the contract is signed. If the difference is too large, an analysis is undertaken and the cost is adjusted where possible.

For example, different assessment of risks or the application of different standards of unit costs may result in a large gap between estimates. If the gap is too wide to be bridged by negotiation, the master contract envisaged the possibility of the work, or parts of it, being undertaken on a cost reimbursement basis (the final amount payable to a contractor is determined retrospectively on completion of the work) or under subcontract with others. The master contract also lays down rules for the use of existing plant and equipment and that which is still to be developed.

The contractor may add certain extras to his price in respect of head office expenses and profit, depending on the type of work concerned. This system would appear to cut out the risk element, but this is not actually the case. The contractor's tender, embodied in his estimate, anticipates working conditions and results still in the future, even though it is based on accepted work procedures. Hence there remains an element of risk, though less than in ordinary tendering.

In general, it can be said that the master contract constitutes a good basis both for the client and for the contractor. The client knows from the outset that he can rely on the contractor's services, while the latter is assured of work with reasonable financial rewards. Both parties must of course be guided by the desire to achieve good results, to conform to planning schedules and keep the cost within the budget. Mutual confidence is therefore an essential ingredient in the relationship.

### Technical

The work has already started even though the design of the actual barrier is still in progress. This involves close cooperation between the Government and Dosbouw in the technical sphere, both as regards design and as regards construction. Responsibility for the design rests with the Government, whereas the contractor is responsible for proper implementation.

Various design offices have been set up within the Rijkswaterstaat organization, each of which is in charge or the design of one part of the barrier up to and including the preparation of specifications. In most cases, members of the contractor's staff are attached to the design offices or are members of working groups associated with the offices.

**General supervision**

PGO (Eastern Scheldt Project Group), the design office's umbrella organization, consists of representatives of the Delta Division, the Locks and Weirs Division and the Bridges Division of the Public Works Department (Rijkswaterstaat), and its duty consists of taking stick of the whole situation at six-monthly intervals and then reporting to the responsible authorities. This regular scrutiny ascertains whether the construction of the barrier still conforms to conditions concerning technology, time, and money.

Dosbouw is also associated with the preparation of the above reports, not only because design and construction are a result of two-way consultation, but also

because at the start of the Eastern Scheldt project contracting organization declared its intention to conform to those overall conditions and thus accepted the moral responsibility to cooperate fully.

A one-side effort by the PGO would moreover not be of much value if it could not at the same time report that Dosbouw was in agreement with its findings.

A result of the method of six-monthly assessment, there is confidence among those concerned, including Dosbouw, that:

- a) technical problems have largely been resolved or will be resolved;
- b) planning targets are being complied with;
- c) the cost will remain within the indexed budget.

**Implementation**

Dosbouw cooperated in implementation with the Government, but in a more formal relationship based on the subcontracts: contractor/constructor vis-à-vis owner/inspector.

*(G. Offringa)*

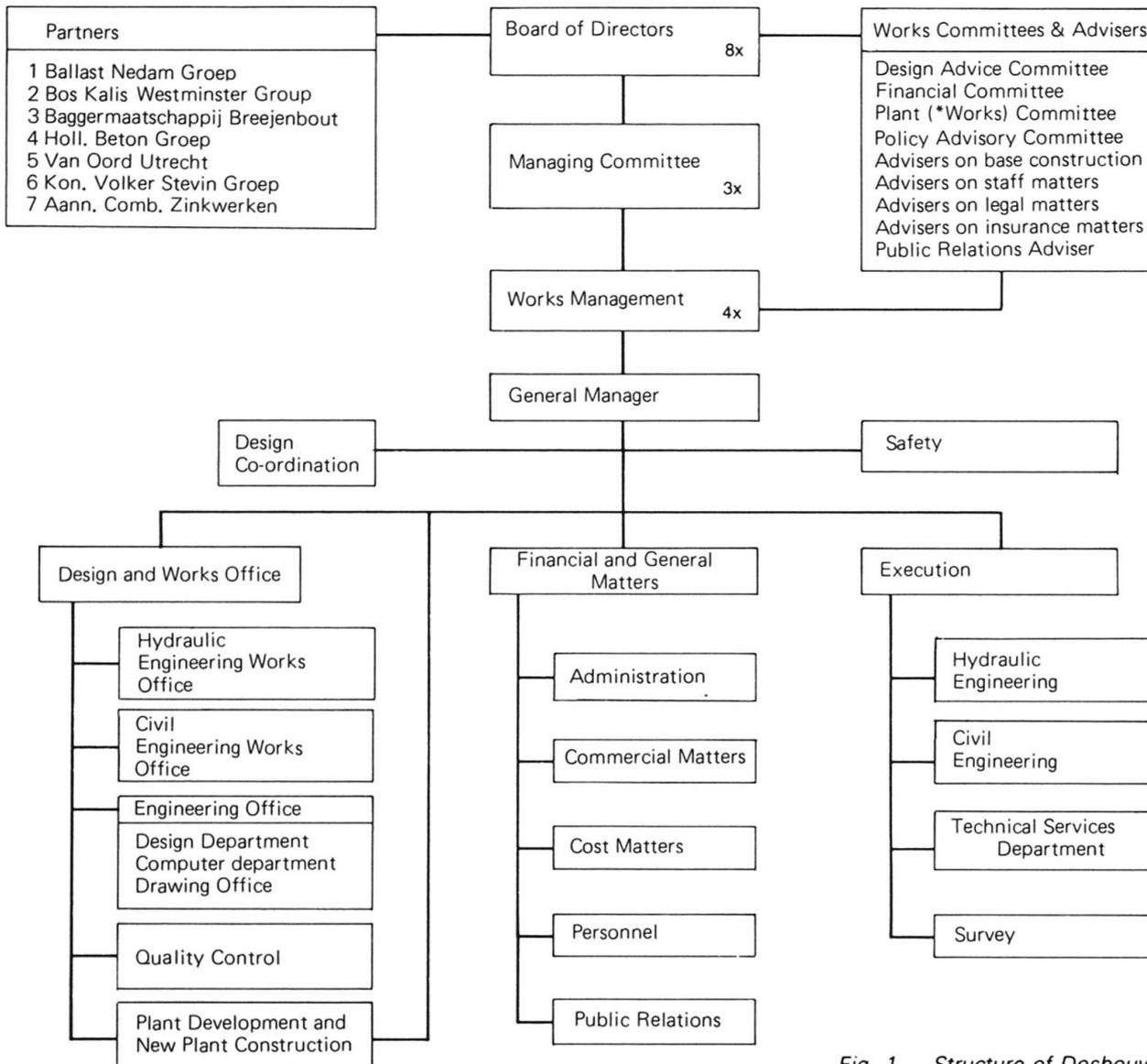


Fig. 1. Structure of Dosbouw.