

PROJECT SHEET

PORT OF RAAHE, FINLAND

THE LARGEST DREDGING CONTRACT IN FINNISH HISTORY,
CHANNEL AND BASIN DREDGING, LAND RECLAMATION

INTRODUCTION

The Raabe project is the largest dredging contract in Finnish history. Access for larger ships is economically important for the clients using the port of Raabe, such as the steel company Ruukki. So it was decided to deepen the entrance channel and to extend the port, creating more land by reclaiming the dredged material from the basin and allowing large container vessels and bulk carriers to enter the extended part of the basin. The port extension eliminates the need to transship goods at sea using barges. The project was carried out by Terramare OY (Finland), the Finnish operating company of the RBW group.

PROJECT CHARACTERISTICS

The project consisted of 4 separate sections:

- construction of a fill area in the basin area
- capital dredging of the basin area and reclaiming this material into the fill area
- removal of the existing breakwater
- capital dredging of the 10 km long entrance channel / fairway

UNIQUE ASPECTS

Rocky ground and extreme cold generated exceptional challenges. The material in the 10 km long entrance channel varied from pure sand to hard dense moraine material. Drilling and blasting work, which was executed by the drill pontoon Pora Eero, was required at several places in the basin area. In the channel and breakwater, a considerable quantity of boulders were found in various sizes up to 42 m³. As a result of the low

FEATURES

Clients	Finnish Maritime Administration (FMA) & City of Raabe
Location	Raabe, Finland
Period	February 2008 - December 2009
Performed by	Terramare OY / Boskalis International, Nordic home market



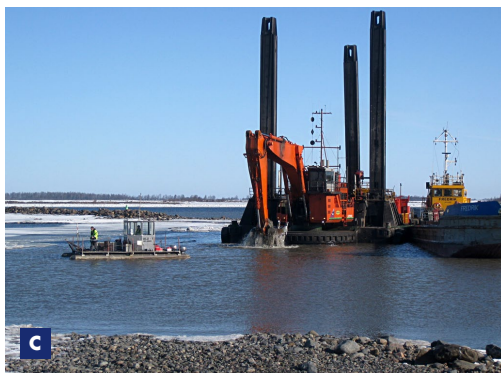
- A** Aerial view construction of jetty and loading berth, with cutter suction dredger 'Vlaanderen 19' in front
- B** Aerial photo showing BHD Attila and BHD MP27 at work in the harbor basin



temperatures, there was a planned winter shutdown from February to May 2009. During the winter months, work continued as long as possible. When the temperature dropped to -20°C , ice brought almost everything to a halt, but it was still possible to do a reasonable amount of work in the harbor basin, where the water was warmed up by the cooling water from the steel factory. To make the most of this opportunity, it was decided that the backhoe dredger (BHD) Attila would stay over for the winter. This turned out to be a good decision: the other ships only managed to sail in on 22 May, but the Attila was already at work in early April.

PROJECT SPECIFICATIONS: PHASE 1

The project started in February 2008 with the construction of the designated fill area; 2,000 meters of bund was constructed from material taken from two existing islands located in the work area. The bund constructions were finished before the dredging of the basin began, because all the dredged material from the basin had to be reclaimed onshore. The first phase consisted of dredging the soft top layer. This work was done by the cutter suction dredger (CSD) Jokra. The dredged material, which also contained moraine material, was pumped into the designated fill areas. During the construction of the bunds the revetment works commenced: geotextile and rocks up to 1.5 t were placed. CSD Jokra dredged 700,000 m³ of the total of 2,000,000 m³ basin volume.



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PROJECT SPECIFICATIONS: PHASE 2

The following phase for the basin contract consisted of dredging the remaining volume with two backhoes and reclaiming it in two separate fill areas. Between June '08 and May '09, the BHD Attila dredged a volume of 800,000 m³. Most of this dredged material was reclaimed by the dragline Manitowoc. Other BHDs dredged a total volume of 500,000 m³, which was unloaded at a temporary quay wall by an excavator and subsequently loaded into dumpers. Because the moraine material was wet and soft, the disposal of this material in the fill areas required special working methods and special skills from the operators. By creating dikes it was possible to excavate 50,000 m³ of the existing breakwater with dry earth-moving equipment. The BHD Attila dredged the remaining volume, which was loaded into split barges and reclaimed onshore.

PROJECT CHARACTERISTICS: PHASE 3

The channel works consisted of a volume of 1,900,000 m³. The channel was deepened to a design depth of -11.50 m. Alongside the BHDs Nordic Giant and Koura, the bucket ladder dredger Ajax was deployed to dredge some of this volume.

PROJECT COMPLETION

During the entire project, there was a strong focus on safety and environmental targets. Toolbox meetings were held on a regular basis and numerous precautions were taken to prevent any negative impact on the environment as a result of this project. Before completion, 'bar sweeping' took place in both the channel and the harbor basin. This typical Scandinavian working method is used to provide a 100% guarantee for the navigational depth. A steel bar is lowered to the required final depth. Dredging a certain overdepth is required to prevent 'hits'. Except for the planned winter breakdown from February to May 2009, there have been no delays during the project.

The project was completed and handed over to the clients in November 2009.



C BHD Attila dredging the breakwater area

D January 2009: discharging the barges at a temperature of -17°C

E The BHD Nordic Giant at work. In the channel and breakwater, a considerable quantity of boulders were found in various sizes up to 42 m³

F Work in progress in Raahe. CSD Jokra in the background

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