Boskalis
Dredging & Marine Experts

PROJECT SHEET

VUOSAARI, FINLAND
CONSTRUCTION OF A COMPLETELY NEW HARBOR IN FINLAND

INTRODUCTION

Vuosaari Harbor is the most significant harbor project in Finnish history; in fact, it is unique even on a European scale. Both existing har-bors in Helsinki's city centre are being trans-ferred to the eastern outskirts of the city. They are being replaced with a harbor with excellent traffic connections that can meet the increa-sing demand for cargo handling. The Vuosaari Harbor Center will provide a competitive and modern service package, with smooth con-nections between harbor operations and other logistical facilities. The harbor center will com-prise the gate area, the closed harbor area and the adjacent Business Parks. The fairway to the Harbor Center will be 32 km long, at least 200 m wide, and 11 m deep. The port area comprises 150 ha, of which 90 ha will be land reclaimed from the sea.

PROJECT SPECIFICATION

The total value of the Vuosaari Harbor projects executed by Terramare is nearly €120 million. Terramare, the Finnish member of the Boskalis group, constructed most of the retaining quay walls and all four jetties. These turnkey con-tracts included the casting of quay elements (108,100 m^3), their installation and the con-struction of coping beams (3,440 meter). Terramare was also responsible for most of the dredging works in both the basin and the channel, including the drilling & blasting of the solid rock in the seabed.

TERRAMARE OY

Terramare specializes in different dredging ser-vices, such as underwater drilling and blasting, port and harbor construction, special slip form techniques, environmental construction and other marine structures. As a result, it is now the leading contractor in Finland, Sweden, Norway, Denmark, Iceland and Estonia. Terra-mare deployed over 100 professionals on the planning and execution

FEATURES

Client	Port of Helsinki
Location	Helsinki, Finland
Period	2003 - 2008
Performed by	Terramare Oy (Boskalis Area Nordic)


A

A Aerial view
B Dredging TBT material
C Elements ready for placement

VUOSAARI PROJECTS SUMMARY

Underwater drilling and blasting 2	40,000 m^3
Environmental dredging	870,000 m^2
Dredging works	4.0 million m^3
Construction of retaining quay walls	2,540 meter
Construction of noise barrier	1,000 meter
Construction of four jetties	910 meter
Construction of ramps	3
Underwater concrete erosion protection	24,300 m^2


B


C

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of different Vuosaari Harbor contracts. Thorough project planning, in combination with the monitoring of punctual progress, ensured compliance with environ-mental, quality and technical criteria.

DEEP COMPACTION WORKS

The different sections of the quay wall were produced under several contracts. In addition to dredging and blasting works, pre-works also included massive foundation and deep compaction works. The actual quay walls were made of retaining wall elements. There were also cast-in-situ coping beams on the top edge of the quay walls. All four jetties were piled with tubular steel pipes (22,860 meter / 768 piles) and built using both ready-made elements and cast-in-situ structures.

The Terramare projects included the construction of most of the elements for the quays, their transportation and installation. Terramare was also responsible for the construction of wide and uniform underwater erosion protection features in front of the quays. They were made as underwater concrete works.

SLIP FORM CASTING

Terramare's wide range of services also inclu-des concrete slip form casting. In the Vuosaari Harbor project, Terramare built, transported and installed around 500 quay elements. The largest elements weigh 300 tonnes. A snow disposal tip was also constructed. Terramare also made a noise barrier wall (1 km long and 13 meter high) using slip forming. Landscaping plants on the façade of the noise barrier will ensure that it blends in with the scenery of the archipelago. There is a public viewing point on the top of the noise barrier.

QUAY WALL CONSTRUCTION

Quay wall construction in Finland differs from many other countries because of the ground conditions of glacial origin. A technique with a number of variations has been developed as an economical and practical method for building quay walls to cope with the local ground conditions. The 3.5 km quay wall was made from prefabri-cated, concrete, L-shaped elements with one or two counter forts. These were mostly built in a dry dock and positioned with a large floa-ting crane. The size of the units was based on the capacity of the floating cranes. As a result of the combination of underwater drilling and blasting, special slip form techniques, environ-mental construction and quay wall construction, this is a highly demanding project that can only be completed successfully by an expert company.


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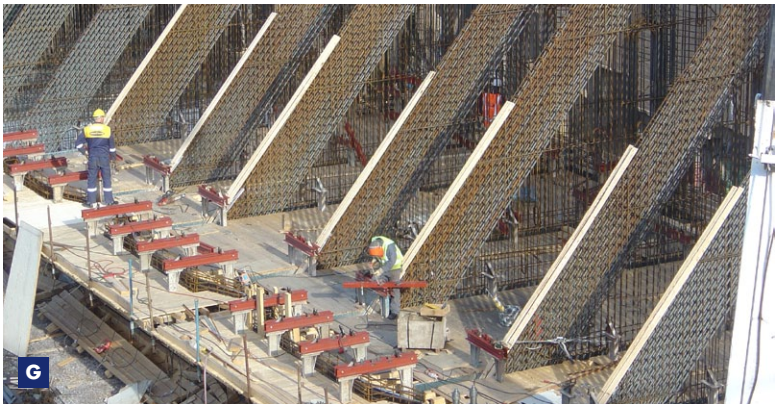
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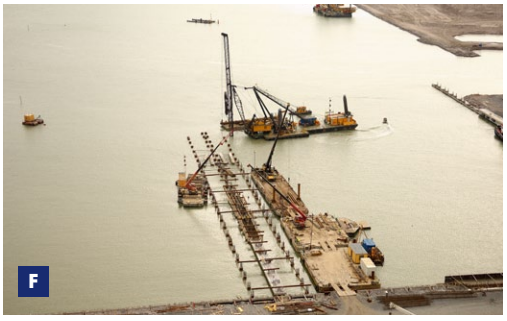
F

D Artist impression of the future port
E Port under construction
F Jetty construction
G Construction of quaywall element
H Placing quaywall element

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