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PROJECT SHEET

WEST HARBOUR, HELSINKI, FINLAND
HERNESAARI PRECONSTRUCTION WORK,
350 m FOUNDATION EMBANKMENT IN THE SEA

FEATURES

Client	Helsinki Public Works Department
Project	Hernesaari preconstruction work
Location	Hernesaari / West Harbour, Helsinki, Finland
Period	June 2016 – March 2017
Contractor	Terramare Oy

SCOPE

The Hernesaari preconstruction work included submarine cable and pipe work, environmental dredging, mass transfer dredging and foundation embankment levelling as well as rock-filling in the sea for a backing embankment 350 metres long and 35 metres wide. The backing embankment was implemented for the new 313-metre cruise ship quay at Helsinki's West Harbour.

QUANTITIES | DREDGING

Environmental dredging	29,000 m^3 / 50,000 m^2
Dredging (Clay/Slit)	85,000 m^3
Dredging (Moraine)	6,000 m^3

QUANTITIES | FOUNDATION EMBANKMENT

Embankment lenght	350 m
Blasted rock filling	315,000 m^3

MAIN PLANT

Backhoe dredgers	Koura (Hitachi 1900-5) Attila (Hitachi EX 1900-5)
Grab dredger	Kahmari 2 (Liebherr HS 895 HD)
Self-propelled barges	George and Hans (500 m^3 each) Terra 1 and Terra 2 (660 m^3 each)
Towable barges	SCG barges (500 m^3 each)
Tugs	Sami (Suomen vesityö Oy) Arska (Towing J & J Oy)
Other plant	Excavators on land

A View of foundation embankment worksite.

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INTRODUCTION >

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INTRODUCTION

Terramare has implemented preconstruction work for a cruise ship quay at the southern tip of Hernesaari. The contract included underwater cabling and pipework, dredging and rock-filling in the sea for a massive backing embankment.

UNDERWATER CABLE AND PIPELINES

The Hernesaari preconstruction contract, ordered by Helsinki Public Works Department, began with the removal of over two kilometres long underwater electricity, telecommunications, water and wastewater connections running from Hernesaari to Pihlajasaari as well as their reinstallation, alongside which the dredging of the site also began.

DREDGING AND MASS TRANSFER

Terramare implemented environmental and mass transfer dredging at the site as well as levelling of the foundation embankment of the future quay structure, where the bottom level was dredged to –18 metres then filled to a level of –12.75 metres. The dredging volumes totalled 120,000 cubic metres.

ROCK-FILLING FOR BACKING EMBANKMENT

The rock filling for the backing embankment of the Hernesaari cruise ship quay was implemented in the sea obliquely from the shore in a south-easterly direction parallel to the present Lokkiluoto–Saukonnokka fairway. The completed backing embankment is around 350 metres long and its upper surface is 35 metres wide. In addition, a 60-metre rock-waste widening was carried out at the tip of the future quay.

Rock-filling was carried out along the entire length, from the sea bottom to an elevation of +2.2 metres. After filling, the tip section of the embankment was finished with erosion protection cladding. The sea-filling consists, in its core, of mixed blasted rock of various sizes and, in its surface layers, an erosion-protected section of screened blasted rock. A total of approximately 315,000 cubic metres of blasted rock was used for the backing embankment, which was filled from on land and sea. For the filling implemented from on land, the blasted rock was transported to the site at a rate of around 20,000 cubic metres per week.

The filling for the backing embankment, which began after approximately 4.4 hectares of dredging, has increased the surface area of Helsinki by approximately 1.6 hectares. The contract was completed in March 2017.

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B Artist's impression of the completed Hernesaari cruise ship quay.

C Implementing of the renewal of submarine pipelines and cables.

D The dredging volumes at the site totalled 120,000 m^3.

E The rock-filling was carried out from on land and sea.