Boskalis Terramare

PROJECT SHEET

PORT OF NAANTALI, FINLAND
COAL AND GRAIN QUAY EXTENSION

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FEATURES

Client	Port of Naantali Ltd, Finland
Projects	Extension of the coal and grain quay
Location	Naantali, Finland
Period	August 2019 – May 2020
Contractor	Terramare Oy

SCOPE

Extension of Port of Naantali coal and grain quay by 82 metres, including bored steel pile foundation, drilled pile wall, deck structures and full jetty equipment.
The extension at the southern end of the quay line extended quay berths 15 and 16.

QUANTITIES | QUAY EXTENSION

Quay extension, length / width	82 m / 20 m
Quay extension, depth	–15.0 m (From 0-level)
Piles, pcs / Ø	110 pcs / Ø 813 mm
Piles length, each	16 – 20 m
Reinforcement steel, total	410 tonnes (deck + piles)
Concreting, total	3,006 m^3 (deck + piles)

MAIN PLANT

Work pontoons	Paalu, Upi and Niina 1
Grab dredger, converted an offshore crane	Meri-Pekka
Other plant	Pile drilling equipment and excavators

A Areal photo of the Port of Naantali quay areas. The quay extension site and its drilling equipment can be seen in the foreground.

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INTRODUCTION >

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INTRODUCTION

The Port of Naantali has extended its coal and grain quay. The 82 metre extension at the southern end of the quay line extended quay berths 15 and 16. The project brings the total length of the quay line to around 460 metres. By extending the quay, the port is preparing for an increase in the number of visits by large Panamax class cargo vessels and for other growing shipping traffic. Terramare implemented a new 82 metres long and 20 metres wide concrete quay extension on a drilled pile foundation.

BORED STEEL PILING WORK

The Port of Naantali quay extension contract was implemented on a steep rocky shore typical of the area. At the outer edge of the quay extension, 20 metres away from the shoreline, the natural depth is 15 metres. Due to the steepness of the shore, the longest drilled piles, installed at the outer edge of the quay, are up to 20 metres long. Pile drilling was carried out from work pontoons Paalu and Upi. As the foundation for the quay extension, a total of 110 drilled piles were installed in solid rock. Each pile is 813 mm in diameter.

The foundation work for the quay extension included a drilled pile wall contained by a transition slab that will prevent flushing of soil from behind it. Around twenty 30-metre anchor rods were installed in the tight, interlocking drilled pile wall. Backfilling of the quay extension was started after the completion of the wall.

DECK STRUCTURES & QUAY ACCESSORIES

After the piling work was completed, the concrete structures of the quay extension deck were implemented. The quay's element beams and shell slabs were casted in Pansio, from where they were transported to the location. The element beams were transported using Terramare's work pontoon Niina 1. The shell slabs were transported by trucks. The elements and shell slabs were installed on top of the quay's frame beams with the assistance of the multi-purpose vessel Meri-Pekka from the sea and the mobile cranes from the land. After element installation, casting of the quay extension deck, surface work and installation of quay accessories, including fenders, bollards and ladders, were carried out.

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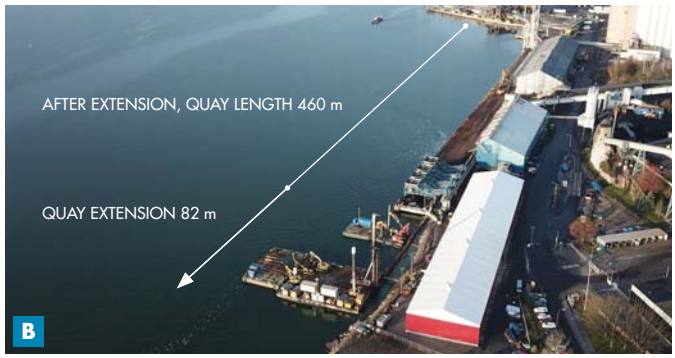

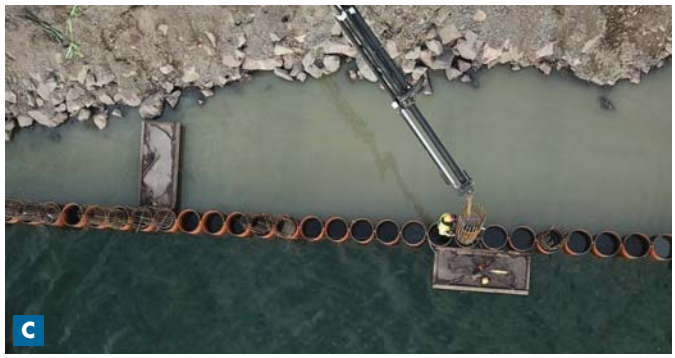

B 110 drilled piles were installed for the 82-metre quay extension.

C The drilled pile wall will prevent flushing of soil from behind it.

D The concrete structures of the quay extension.

E View from the sea of the coal and grain quay extension.