## CASE PORT OF KOKKOLA

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<th>PORT OF KOKKOLA</th>
<th>Key words:</th>
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<td>Kokkola, Finland</td>
<td>Contaminated dredged sediments, port expansion</td>
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<td>Port expansion</td>
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### General information

Case Port of Kokkola was a pilot project which included the dredging and stabilization of contaminated sediments. The project was done in Silverstone (Hopeakivi) Port area, where a new quay will be built. The port is expanding to sea and the building of harbour areas demands filling of millions of cubic meters. With dredged sediments, the requirements for filling can be reached quite fast. The pilot was part of the SMOCS project.

### Advantages of stabilization

The contaminated sediments can be utilized in the port extension. The results from the dredging and stabilization will be used in future handling of the sediments from dredging of fairways. Stabilized masses fulfilled the requirements for construction of harbour areas. The obtained results will be exploited in the future expansion of the port.

### Project timetable

Dredging and mass stabilization in 2011.

### Volumes and dimensions

$\approx 12,500 \text{ m}^3$

### Geology and stabilized material

The soil type of the dredging mass varied between silt - sandy silt – sand. Average index properties $w=20 \%$, $\rho = 2023 \text{ kg/m}^3$, $\text{LoI} = 0.7 \%$, $pH=6.6$

### Target strength of the stabilized material

Shear strength $\sim 50 \text{ kPa}$

### Binder(s)

Rapid cement $0-30 \text{ kg/m}^3$, fly ash $100-200 \text{ kg/m}^3$

### Laboratory and field tests

Testing included geotechnical properties of stabilized material, strength, development of strength along time, water permeability and environmental suitability. During and after stabilisation quality control and quality assurance were conducted.

### Other

The stabilization started with $30 \text{ kg/m}^3$ cement + $100 \text{ kg/m}^3$ fly ash. The obtained shear strength was at some points very high and therefore fly ash (without cement) was used $150-200 \text{ kg/m}^3$ as such for the rest of the stabilization.

### Long-term follow-up and lessons learned

Quality drillings after one year in 2012. The shear strength was clearly over the target value.

### Sources


### Stabilization contractor

Biomaa Oy
Dredging and dumping areas

Ongoing mass stabilization

Test pit for technical quality control