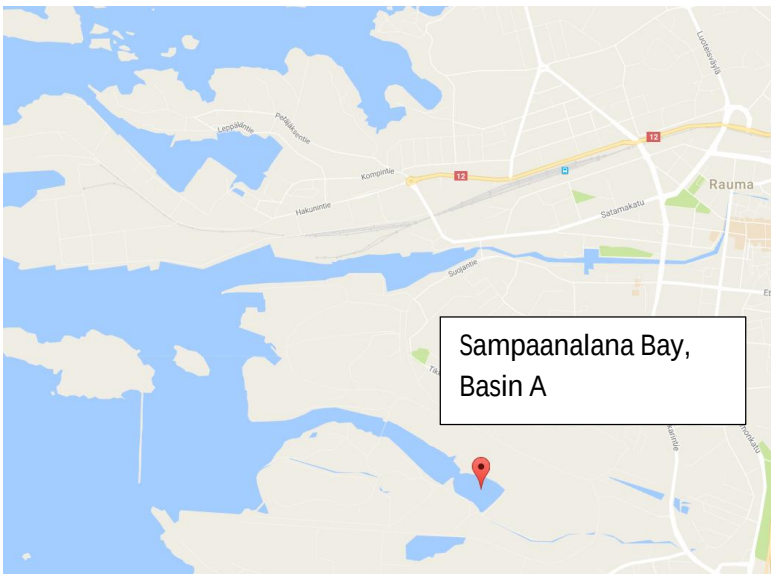
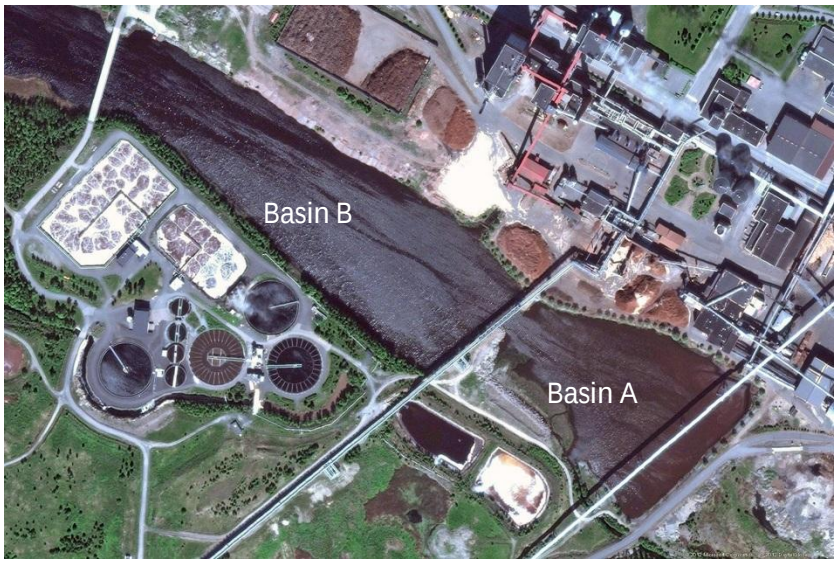
CASE SAMPAANALA BAY, BASIN A

SAMPAANALA BAY, BASIN A Sampaanala, Rauma, Finland Coastal bay filling and storage field construction	Key words: Field construction, water body filling, sediment stabilization
General information	The coastal bay in Sampaanala was filled, and the subgrade was stabilized for storage field use. When the work started the depth of water varied between 0-3.5 m. The construction of the area with traditional methods like mass exchange and filling would have been extremely expensive. The working order in project area was: 1. Screening sunk logs and other debris 2. Mixing surplus clay, fly ash, bottom ash and kaolin to sediment to making it easier to stabilize 3. Premixing of the masses with excavator 4. Mass stabilization 5. Geotextile installation 6. Preload embankment.
Advantages of stabilization	With mass stabilization technique the subgrade improvement of soft sediment was carried out in an economical way and the area was obtained for storage use for the nearby pulp and paper industry. In addition, the industrial waste fractions from nearby industry could be utilized on site instead of landfilling.
Project timetable	Field tests in 2012, mass stabilization in 2013.
Volumes and dimensions	Stabilized area in the basin A was 1.5 hectares and the total volume of the stabilized mass was 145 000 m^3. The mixture of sediment and other materials was stabilized up to 5-7 meters depth. The stabilization of the basins B and C will be carried out later. The total area of basin A, B and C is ≈10 hectares.
Geology and stabilized material	The original sediment in Sampaanala bay contained clay and organic mud up to 10-17 m depth.
Target strength of the stabilized material	The target compression strength for the stabilized material was 80-100 kPa (shear strength ~40-50 kPa)
Binder(s)	Cement + dry fly ash 50:50, 260 kg/m^3. Aged fly ash, lime waste, and kaolin clay was also added to base material. Appr. 15 000 ton of cement, 120 000 ton of fly ash and 170 000 ton of various other industrial by-products were used in the basin A.
Laboratory and field tests	Laboratory tests included geotechnical properties of stabilized material, binder optimization and frost behavior studies of stabilized material. The environmental monitoring was done in surrounding water body during the construction. During and after stabilization quality control and quality assurance were also conducted.
Other	According to quality control the targeted strength was achieved nearly all areas.
Long-term follow-up and lessons learned	Storing of dry fly ash from the local power plant was tested in tent hall. The method was found functional and relatively cheap for short time dry storage of fly ash.
Sources	Niutanen, V. 2015. *Mass stabilization of Sampaanalanla bay, Rauma, Finland. Utilization of forest industry by-products as a binder material for mass stabilization*, Mass stabilization conference 2015, Lahti, Finland. Lahtinen, P., Pitkänen, T., Heikola, R., Jyrävä, H. & Suikkanen, *T. 2018. Utilisation of industrial waste and contaminated sediments in the construction of coastal bay: Sampaanala bay pilot*. WASCON 2018, 6.-8.6.2018, Tampere, Finland. pp. 284-291.
Stabilization contractor	Lemminkäinen Oy



Aerial picture of Sampaanala Bay



Stabilization work ongoing in Sampaanala Bay

Stabilized and pre-loaded basin A