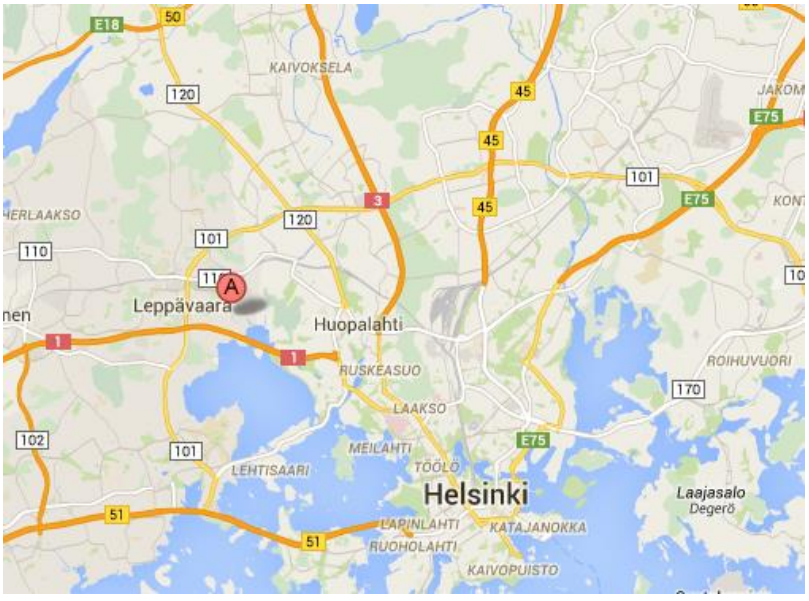
PERKKAA DOG PARK
Perkkaa, Espoo, Finland
Park construction with the use of surplus soils

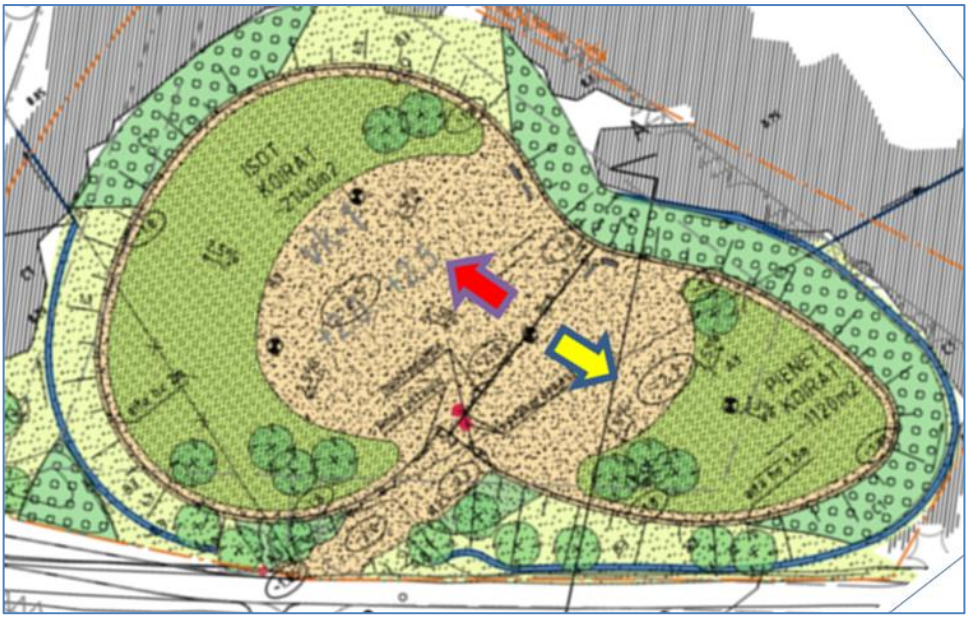
Key words:
flood embankment, utilisation of surplus soils, use of fly ash from coal combustion as binder agent

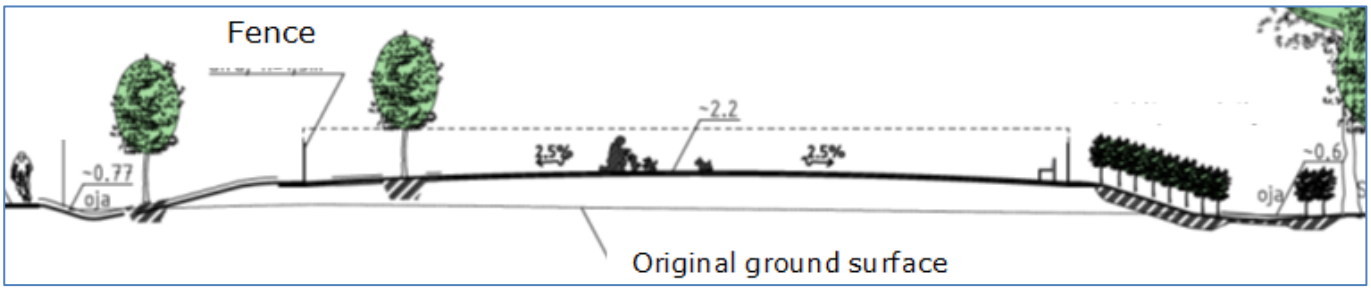
General information	Perkkaa Dog Park is located in the flood prone zone where the soil is of poor bearing capacity. In construction process, the ground level was raised from about +0.7 to +2-2.5 with the use of surplus soft clay obtained from a neighbouring construction site. Very soft clay was transported to the site and placed on the cleared subsoil curbed with an embankment made with dry crust clay. The upper part of the subsoil was stabilized together with the surplus clay layer. A working bench and the bearing courses of the park were constructed on top of the stabilized layer.
Advantages of stabilization	By utilizing surplus soil masses that were transported from a neighbouring site (≈200 m) it was possible to avoid transportation of these masses to the soil landfill (tens of km). The utilization of the fly ash from coal combustion as a binder agent allowed diminishing the environmental impacts of the construction process.
Project timetable	01/2013-02/2013 mass stabilization
Volumes and dimensions	The area of the Dog Park is 4500 m^2 and the volume of mass stabilization 13 000 m^3
Geology and stabilized material	Subsoil: weak dry crust layer of 0.5-0.9 m ($\tau_{unreduced}$ ≈30-40 kPa) and clay z_{max}≈ 11-14 m ($\tau_{unreduced}$ ≈ 8-10 kPa, $w_{z\approx0\text{-}3m}$ =105-130 % and $w_{z>3m}$ = 65-80 %
Target strength of the stabilized material	Shear strength 30 kPa (28 d) and 40kPa (90d)
Binder(s)	Area A and B: cement 80 kg/m^3, Area C: cement 60 kg/m^3 + fly ash /FGD 1:1 100 kg/m^3, Area E: lime cement (3:7) 60 kg/m^3 + FGD 50 kg/m^3
Laboratory and field tests	Quality control soundings and test pits after stabilization. Beside of test pits, the following field investigation methods were used: pocket vane penetrometer and penetrometer tests, Niton XRF, determination of water content and pH. The target average shear strength 30 kPa was achieved.
Other	Because surplus soils were stabilized with the use of not only cement but also fly ash and FGD, there was a need to apply for environmental permit.
Long-term follow-up and lessons learned	Lysimeters were installed under the stabilized layer and settlement plates on its top. Water samples will be collected and analysed and the settlement plates will be measured in the course of many years.
Sources	Forsman et al. (2013): *Pilot Construction Report 2013, Dog Park, Espoo, Perkkaa* Forsman et al. (2013). *Experiences of utilizing mass stabilised low-quality soils for infrastructure construction in the capital region of Finland – case ABSOILS project*. The XXVIII International Baltic Road Conference, Vilnius, Lithuania, 26.-28.8.2013.
Stabilization contractor	Lemminkäinen Oy



Mass stabilization in progress.

Plan of the Dog Park.





Cross section of the Dog Park (above) and ready park (below)