

Stabilisation project – step by step

- Laboratory tests
- Designing
- Quality controlling
- Execution

Marjo Ronkainen 9.10.2008

International Mass Stabilisation Conference, Lahti Finland

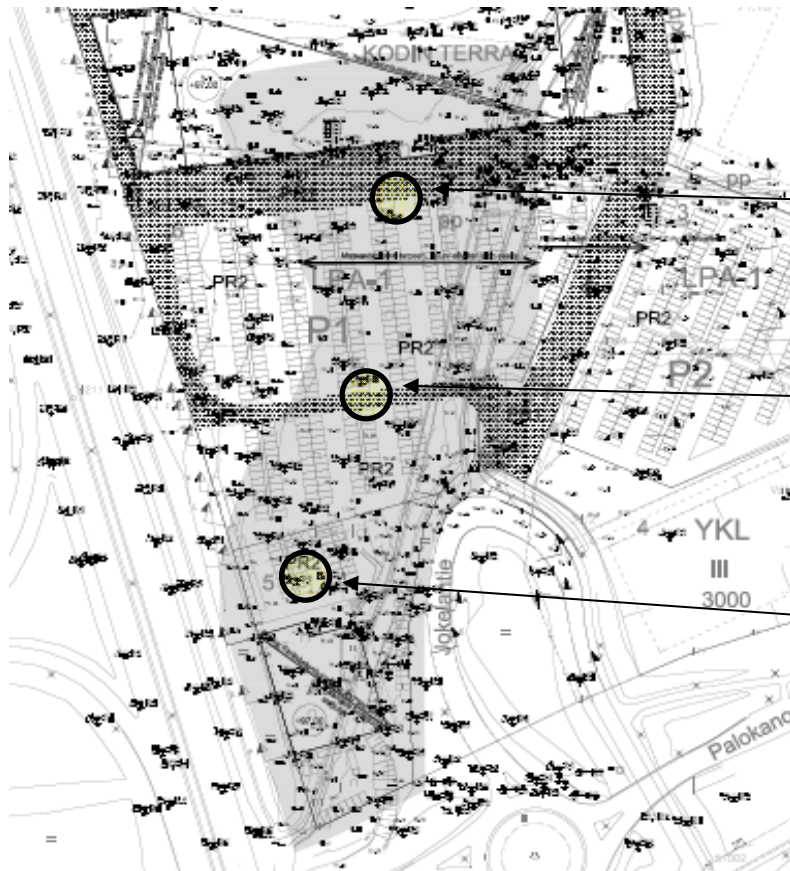
Soil samples for laboratory tests

- Sampling is based on site investigations.
- Reliable laboratory results are based on adequate amount of samples -> Rather too many than too few samples!
- Wrong conclusions may be done as a result of improper sampling. That may cause additional costs or lower quality than targeted.
- Samples are excavated (bulk samples) or they can be taken into sample tubes. Sampling disturbance is allowed.
- Samples should be stored and transferred in temperature over 0°C. The sample in container must be protected from air, water and light.
- It should be noticed during sampling and handling of samples if the area may be contaminated.

Places of sampling

- Usually one or two main sampling points are chosen
 - The points will be chosen to find:
 - the most problematic layers for the tests
 - the most critical areas for designing parameters
 - high watercontent
 - high LOI (organic content)
 - some chemical properities (f.ex. sulphate)
- > if the recipe works with difficult materials, the results will be at least as good with easier materials

An example of sampling for laboratory tests



Samples from line G-G:

- peat 15 litres, depth 1.5-2 m
- silt 10 litres, depth 4 m
- little samples a`0.5 litres
- 1 sample / 1 m to the depth of 6 m

Samples from line J-J:

- peat 10 litres, depth 2 m
- little samples a`0.5 l
- 1 sample / 1 m to the depth of 6 m

Samples from line O-O:

- peat 25 litres, depth 1.5 m
- peat 25 litres, depth 3 m
- silt 10 litres, depth 4.5-5 m
- little samples a`0.5 litres
- 1 sample / 1 m to the depth of 6 m

Choosing of suitable binder and optimal amount of binder

Preliminary tests

It is often useful to make some specimens immediately and test their strength after 1-5 days. It gives a rough estimate of possible binders and amount of them. Also grain size, organic content etc. of samples should be tested.

First step

Tecnical tests (strength and water permeability etc.) and necessary environmental tests (leaching etc.):

- Suitable binder
- Strengthening during time (7, 14, 28, 90 days)
- Amount of binders

Second step

Optimising the amount of binder using tecnical, economical and environmental aspects. Also it could be useful to test parameters of stabilised material in real conditions using f.ex. loading.

Examples of new binder admixtures and components

- Cement
- Cement + CaO
- Cement + blast furnace slag
- Gypsum
- Ashes

etc.

