Instructions for soil treatment with lime

The soil treatment with lime improves the soil quality through:
• improved paving property and condensability of soils;
• facilitated performance of construction works;
• increased load-bearing capacity and frost resistance, together with stress resistance to traffic and climate.

We suggest:
• with wet soils:
  o Nekasol 2 bulks, in 20 kg bags or big-bags (1000 kg)
• with unusually dry soils:
  o Nekapur 2 bulks, in 25 kg bags or big-bags (800 and 1000 kg)

Lime dosage

The appropriate dosage is determined by the water content and the intended purpose. This must be determined before the start of construction with a performance test. Besides the type and the quantity of lime, water content of the soil, Proctor density and optimum water content, work experience is important, too.

For the performance test use as reference for the dosage (in each case related to dry matter content):
• Soil improvement: 2 to 4 mass percentage nekasol 2
• Soil stabilization: 4 to 6 mass percentage nekasol 2

For the soil stabilization, the quantity of binding agent should be such, that the determined values of the cylinder compressive strength to freeze-thaw stress do not fall below the standard requirements.

Execution of construction work

Normally the mixed-in-place process is applied. In this case, different variants are useful for the soil improvement, depending on the point of withdrawal and the installation location. Central mixing processes (mixed-in-plant), the processing of the soil in a central mixing plant, are applied only in exceptional cases.

Before, during and after the improvement work, please ensure that there isn’t any water penetration laterally or from below in the structure. Likewise, rainwater must not stagnate on the planum.

The following procedure is suggested:

1. Preliminary works:
   - Removal of topsoil, vegetation, major stones
   - Crushing of heavier soils
   - “Solubilize” very moist soils with 1 to 2 mass percentage nekasol 2
- Pre-grading and profile of a cross slope with a dozer or a grader
- Pre-compacting of provided layer for the soil stabilization, if necessary

2. Lime distribution
- Transport of lime in silo-truck on site, filling in spreader or intermediate silo
- Bagged goods or big-bags are possible, too
- Binding agent spreader with dosing unit
- Reduction of the dust formation by roughening the soil surface, coating the spreading auger and instantly mixing the lime in the soil.

3. Lime mixing into the soil:
- With appropriate devices, that enable a uniform mixing
- Mixing to obtain uniform color and structure
- Number of mixing procedures and depth depending on soil conditions and performance of the mixing machines
- For multi-layer installation: denticulation of layer by ensuring mixing depth

4. Grading and compacting of the soil-lime mixture:
- Provide a sufficiently even planum, compacted with standard earthwork machines
- Processing time for the soil-lime mixture: preferably up to 48 hours after blending the lime, such as considerable facilitation of construction disposition.
- The optimum compaction of the mixture is achievable only after approximately four hours of reaction time between soil and lime
- A particularly good penetration with vibro-compaction machines
- The most efficient on site: large-scale equipment, in small sites: lighter trailed implements and compaction machines

5. Post-treatment under extreme meteorological conditions:
- Meet appropriate measures, i.e. moisturization of the planum or spraying of bituminous emulsion with high air temperature. See weather influence.

Weather influence

If the defined water content of the soil for the adequate compaction is exceeded through slight precipitation, it can be balanced with an appropriate increase of the lime addition. In doing so, the milling of the lime into the soil must take place as immediately as possible after distribution. Otherwise, the reactivity of the lime is decreased. During heavy precipitation, the works must be stopped.

When the building construction is in progress and at the end of the construction, an efficient drainage must be present, so that stagnant or running water cannot cause any damage.

Soil treatment of frozen ground with lime is not recommended. Soil stabilizations should not be performed with air temperatures below 5 °C. If slight frosts with low soil penetration can be expected, soil stabilizations with lime should be protected from frost effects (i.e. through completion of the superstructure).