



CONSOLID TOPICAL

CONSOLID UK LTD

1 2003

THE REASONS FOR SOIL STABILISATION

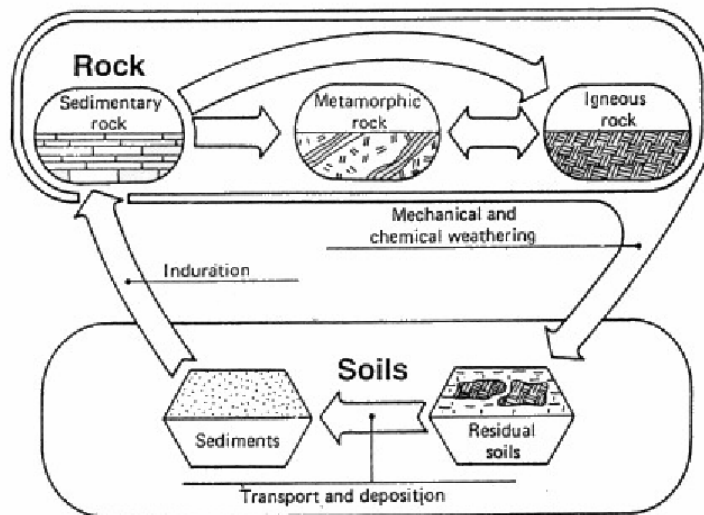
How the CONSOLID SYSTEM differs from all other methods in use for this purpose. The start of the NEW YEAR is a good opportunity to discuss fundamentals of our business – WHY soil stabilisation, or rather soil improvement, of low-class soils is becoming increasingly important and WHAT makes the unique CONSOLID SYSTEM so different from any other method used for soil stabilisation.

From all activities of the last century to improve soil performance, only two groups of products are under use today:

BINDER or GLUES, which try to bind soil particles artificially together by incorporating them in the soil mix - in particular cement, lime, asphalt and some polymers. What they have in common is the problem that they do not work with all types of soil; the ever changing specific surface of the treated soil makes it in practice impossible to apply the right quantity of binder, which is necessary if the binding effect shall be effective. It is really a physical problem you cannot overcome in the field.

CHEMICAL REACTANTS form another group. Here we have the problem that the right reaction only takes place with the right partner. Due to the fact that the chemical composition of any soil is different, you can get the desired effects only with specific partners, but too often only partial or even a reverse effectiveness. This way is limited due to the chemical problems which occurs. Due to the fact, that both ways do not allow reliable and permanent improvements of all existing soils, we started, 35 years ago, looking for another way to solve this problem in a foreseeable and permanent way. These efforts led to our unique CONSOLID SYSTEM.

THE CONSOLID SYSTEM copies nature, which shows us that soils are only an aggregate constitution of rock. Soil used to be rock, which was turned into soil by weathering, chemical and mechanical forces, but the soil has not lost the ability to become rock again – nature recycles the soil to rock; the problem is only that this takes millions of years.



The graphic shows this natural recycling of soil to rock – the breaking idea was to find a way, to speed up this process of induration to get the treated soils performing toward petrification. In chemistry, processes which require long reaction times and high pressure – such as the transformation of soil into rock – can be changed and sped up dramatically by the addition of catalysts. Following the same way, we could expect that activating agents, added to the soil, can change the soil behaviour in the same way, irrespective of its composition, thus obtaining the same improvement with the same quantities of added activators. During 13 years of R&D work in laboratories and the field we found the right solution, which allows today to improve any kind of existing soils in a permanent and convincing way, upgrading them to risk-free construction material.

In any earthwork where low class soils have to be used, any improvement of their behaviour must be reliable and permanent and the effectiveness must be foreseeable. Laboratory tests must show in a reliable way what you can expect when using the CONSOLID SYSTEM in the field.

- Already informative simple laboratory tests show very impressive the difference between the same soil, untreated and treated;
- Adding missing fractions: You can improve the effectiveness of the CONSOLID SYSTEM already in the laboratory test by adding missing fractions to the plain soil to be tested. This represents a kind of mechanical stabilisation, where too sandy soil gets sufficient clayey fines, and too clayey soils sufficient sand and coarse material for a dense packing. Always imagine in your mind that you are dealing with "rock". The high compressive strength of rock depends directly upon a reduction of voids in it close to zero – therefore if you copy a dense packing by adding the missing fractions you contribute already to the best performance – you will get with the same investment for THE CONSOLID SYSTEM a multiplication of the improvement.
- Dry back the test blocks before testing: Any laboratory test with treated soil, compared with the same untreated one, will show substantial

improvement. To get results, which are as close as possible to the conditions in the field, it is recommended to dry back all test blocks – treated and untreated – to 50% of the O.M.C. before any immersion or any other test where the test blocks are exposed to the influence of water. Especially clayey soils become sensitive to water influence comparable with the field performance when dry – at OMC they show often incorrect values, e.g. too high CBR values, which collapse when the untreated soil becomes dry.

In the following monthly letters we will go deeper into details of informative testing of any in situ soil as basis for your recommendation to your clients to give you the best arguments for negotiating with experts.

The specifications in use in all countries in the world are more or less concentrated to materials which are used in conventional earthwork – mostly selected, high-quality material, such as gravel, sand, crushed stones. The ongoing change to materials of lower quality is enforced by the fact that these selected materials are or become scarce or exhausted, as well as the fact that the disposal of excavated, low-class soils becomes more and more a very expensive problem.

Already these laboratory testing and the results differ remarkably from any other method – you obtain reliable results, which will be proved in the field. If properly applies, the CONSOLID SYSTEM cannot fail...

The use of low class soils will be possible for all kinds of earthwork if the behavior of these soils is permanently improved. With the treatment you get a new construction material, with a completely changed behavior, and the way how it works makes it possible to use the treatment not only "in place" but also "in plant".

- In coming monthly letters we will discuss these improvements, the longtime performance of treated soil, the possibility of producing pre-mixed soil mixes, which will always show the same performance in respect of density, compressive strength, C.B.R. or E-modulus, tailored to the requirements of the clients, but also the possibility of respecting all these advantages in the design of any earthwork, which leads to substantial savings in costs, already during construction, in the range between 20% and 50%. But also the reduction of maintenance costs will be discussed and how to maintain CONSOLID roads in the best way to get an optimal durability. Some of this information will already be well known by you, but will be a valuable reminder in your efforts to convince your clients and bring them up to date in respect of making use of our well established technology. But you are also invited to participate in this compendium, in which the experiences of all our world-wide partners and clients will lead to an update and exchange of these experiences.

- The application fields for the CONSOLID SYSTEM has been widened in the last decade. We started with road construction and rehabilitation, but soon it was found, that the CONSOLID SYSTEM can also substantially contribute there, where seepage prevention is required, like in artificial ponds, dams, dikes, waste dumping grounds or in the bottom of landfills. The production of air-dried soil bricks for housing becomes again an interesting market due

to the reduction of air-borne pollution by fumes and the increased costs of energy.

The chances in the market are excellent, even under the partly worsened economical conditions. They will improve, and it will save costs with the CONSOLID SYSTEM.

Our best wishes may accompany you into the NEW YEAR.

Kind regards

Dr. G. Scherr