AustStab Technical Note

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Lime Stabilisation Fact Sheet

In September 2014Professor Dallas Little, Texas A&M Transportation Institute, attended the Queensland Department of Transportation and Main Roads (TMR) Technology Forum. He gave a lecture on lime stabilisation and conducted a question and answer session. The succinct information coming from Professor Little, industry experts and TMR's experience shows the clear advantages of lime stabilisation of subgrades.

A summary of the facts regarding lime stabilisationfollows:

1 Lime Demand Test

It is essential a lime demand test be carried out on the soil to be treated. Sufficient lime must be added to soil sample for the pH to reach 12.4 , this ensures that the alkaline level is high enough to ensure the creation of **long-term stable** cement like substances as a result of the reaction between the pozzolans in the clay and the lime.

2 Flocculation

The immediate effect of the addition to suitable clay materials immediately causes flocculation of the clay particles, resulting in:

- Reduced plasticity
- Drying out of wet materials
- Increased CBR
- Reduced shrink/swell from reduced
- Facilitates Compaction

3 Uses of Lime stabilised subgrades

There are two design approaches to lime treated subgrades, both rely on the at least the minimum amount of lime to be added to achieve permanency (as defined by a minimum pH of 12.4 in the Lime Demand test).

- Use the minimum lime content plus 0.5% and determine the resultant CBR. This CBR result is used to determine the pavement thickness required above the treated subgrade.
- Use a range of lime contents above the minimum content to ascertain the resultant unconfined compressive strength (UCS). From this point a minimum UCS is determined to optimise the pavement design.

4 Permeability

The addition of small amounts of lime modifies the clay to a granular like material so increases the water permeability. However, because of the chemical change the resultant soil structure, it does not attract and absorb water as the natural clay.

The addition of more lime to reach a pH of 12.4 required by the lime demand test, and consequently forming long-term cementing reactions, reduces the permeability of the stabilised clay.

For more information about the Association, please write to the Chief Executive Officer, AustStab, PO Box 738, Cherrybrook NSW 2126 or email: enquiry@auststab.com.au or visit the web site at www.auststab.com.au