

AustStab Construction Tip

No.7 July 2003

The steam cloud emanating from the slaking of quicklime

Introduction

The slaking of quicklime involves the conversion of quicklime [Calcium Oxide] to hydrated lime [Calcium Hydroxide]. The following equation shows how the chemical reaction occurs.



This exothermic reaction heats the excess water and produces steam as shown in Figure 1. For more information refer to AustStab Technical Note *Lime Stabilisation Practice*.

Job site conditions

In the field slaking is achieved by spraying water from a water cart onto the quicklime that has been spread on the road. As shown in Figure 1 this produces a plume of steam and the extent of this plume of steam varies depending on the atmospheric conditions at the time and reactivity of the lime. On a cold day the steam cloud appears to be more pronounced.



Figure 1

It is important to note that although this plume does contain some very small portions of lime dust (ie $\text{Ca}(\text{OH})_2$) it is largely a cloud of steam. Measurements of the dust levels immediately above the slaked quicklime in the laboratory are relatively low and diminish dramatically with distance from the surface.

Despite the fact that these plumes are predominantly steam it is recommended that neither site workers nor the general public have prolonged exposure to these steam clouds. Works management plans should be devised to prevent prolonged exposure.

During the slaking process it is important that traffic is managed correctly as the sight distance for drivers may be affected by the steam.

Bibliography

1. AustStab Technical Note 1 *Lime Stabilisation Practice* Australian Stabilisation Industry Association, Artarmon (NSW), May, 2002.
2. Fairhurst, H *Dust composition and load in the steam of slaked quicklime for soil stabilisation* Report by Cockburn Cement Limited, Munster (WA), 2002.
3. Little, D *Lime stabilization of bases and subbases* Kendall Hunt Publishing Company, Iowa, USA, 1995.

Web Sites

AustStab home page <http://www.auststab.com.au>

The Association is a non-profit organisation sponsored by organisations involved in the stabilisation and road recycling industry in Australia whose purpose is to provide information on the use and practice of pavement stabilisation. This Technical Note is distributed by the Association for that purpose. Since the information provided is intended for general guidance only and in no way replaces the services of professionals on particular projects, no legal liability can be accepted by the Association for its use.

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