

10. Effectiveness of Moisture-retaining and Insulated Curing Mats for Curing Tunnel Lining Concrete

Kunikazu Azuma, Toshiyuki Ishii, Kenji Saitou

The quality of lining of mountain tunnels needs to be improved by improving the curing conditions. The developed curing equipment is capable of retaining the moisture and insulating the heat. The equipment was applied at the site, and the temperature, humidity and strain of the lining concrete and the temperature and humidity in the tunnel were measured. As a result of using the curing equipment, the relative humidity on the concrete surface was kept higher than in the tunnel by 85% or more and the temperature on the concrete surface higher than in the tunnel by 3°C or higher owing to the heat insulation effect. Retaining the humidity and temperature reduced internal shrinkage strain, controlled cracking and improved the quality of concrete surface. The curing effect was also evaluated by comparing the measurements with the results of thermal stress analysis considering moisture diffusion.

Key words: lining concrete, curing equipment, dry shrinkage, moisture diffusion, thermal stress analysis