

Nondestructive Testing for Reinforced Concrete Buildings with Active Infrared Thermography

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Abstract : Infrared thermography (IRT) technique has been proven to be a good method for nondestructive evaluation of concrete material. In the building, a broad range of applications has been used such as subsurface defect inspection, energy loss, and moisture detection. The purpose of this research is to consider the qualitative and quantitative performance of reinforced concrete deteriorations using active infrared thermography technique. An experiment of three different heating regimes was conducted on a concrete slab in the laboratory. The thermal characteristics of the IRT method, i.e., absolute contrast and observation time, are investigated. A linear relationship between the observation time and the real depth was established with a well linear regression R-squared of 0.931. The results showed that the absolute contrast above defective area increases with the rise of the size of delamination and the heating time. In addition, the depth of delamination can be predicted by using the proposal relationship of this study.

Keywords : concrete building, infrared thermography, nondestructive evaluation, subsurface delamination

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