

10. An Analytical Study on the Prediction of the Progress of Carbonation of Tile-finished Concrete

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In order to make a theoretical study on the progress of carbonation of tile-finished concrete, a method was proposed for predicting the progress of carbonation using a model in which carbonation progressed owing to the intrusion of carbon dioxides through the joints of a tile. Data that was collected in accelerated carbonation tests on tile-finished concrete and presented in existing works was compared with the values predicted using a proposed equation. As a result, the predicted values were nearly in agreement with the test results. Thus the applicability of the prediction method was verified. The carbonation of tile-finished concrete was predicted in a building. It was then verified that tile finishing was highly effective for suppressive carbonation and the effect of joint width on carbonation was quantitatively shown. A simple method was also proposed for predicting the carbonation of tile-finished concrete using the convergent value of modulus of carbonation rate that could be obtained from tile length and joint width.

Key words: concrete, carbonation, tile finishing