

Committee Report: JCI-TC201A

Technical Committee on the Role and Application of Academic Research in Predicting the Deterioration of Concrete Structures

委員会報告：JCI-TC201A

コンクリート構造物の劣化予測における学術研究の役割とその成果の活用に関する研究委員会

Yoshitaka KATO, D.Eng.: Tokyo University of Science

加藤 佳孝, 博士 (工学) : 東京理科大学

Manabu KANEMATSU, D.Eng.: Tokyo University of Science

兼松 学, 博士 (工学) : 東京理科大学

Takeshi IYODA, D.Eng.: Shibaura Institute of Technology

伊代田 岳史, 博士 (工学) : 芝浦工業大学

Takahiro NISHIDA, D.Eng.: Shizuoka Institute of Science and Technology

西田 孝弘, 博士 (工学) : 静岡理工科大学

Koichi MATUZAWA, D.Eng.: Building Research Institute

松沢 晃一, 博士 (工学) : 建築研究所

Contact: jci-web@jci-net.or.jp

Keywords: Deterioration prediction, academic research, water and concrete deterioration, water and rebar corrosion, performance evaluation

Abstract

This technical committee conducted its activities to link engineering models used in deterioration prediction in maintenance management and the results of environmental and phenomenological evaluations with the survey results of actual structures. We summarized earlier academic results (theoretical and phenomenological results) and survey methods related to structural deterioration and investigated approaches to utilize these results for the deterioration prediction of actual structures. Further, we focused on water as an action, summarized concrete deterioration and rebar corrosion, and we summarized the current status of research and issues, which includes those on structural performance evaluation.

1. Introduction

In concrete structures, the extent of deterioration varies depending on the materials used, construction conditions, environmental conditions of the structures in service, and other factors. Therefore, it is important to determine the causes of deterioration accurately, predict the deterioration progress with the necessary accuracy, and perform structural maintenance to ensure that these structures can satisfy the predetermined performance over the planned service period. Complex environmental actions and physicochemical phenomena need to be considered to predict the deterioration progress of actual structures for maintenance

management accurately. The prediction method is very complicated even if these effects can be considered in deterioration prediction. Meanwhile, the use of engineering prediction methods is considered desirable for practical maintenance management. Information obtained from structures impacted by the actual environment over time can fill the gap between the above two aspects.

This committee summarized earlier academic research results (theoretical and phenomenological) and survey methods related to the deterioration of structures, and they investigated their use in the deterioration.....