# Committee Report: JCI-TC202A
# Technical Committee on Verification & Validation (V&V) in Structural and Durability Simulations of Concrete Structures

## 委員会報告：JCI-TC202A
## コンクリート構造物の構造・耐久性シミュレーションにおける検証と妥当性確認に関する研究委員会

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## Abstract
In this technical committee, we investigate the applicability and issues about the Verification & Validation (V&V) of simulations conducted in the field of concrete engineering. To this end, we presented some examples of common analyses aimed at implementing V&V and the content discussed within the committee. Further, we introduced results of benchmark experiments of RC beams with various parameters on the mechanical behavior. Moreover, we summarized the current status and problems related to the durability simulation.

## 1. Introduction
In the field of concrete engineering, many simulations have been conducted to evaluate the mechanical behavior and deterioration phenomenon of concrete structures. Several technical committees have been established in this society, Japan Concrete Institute, and relevant activities have been conducted proactively. However, there is no clarity on the current validation method for the simulation results up to now. General-purpose simulation codes have become widespread, and it has become easy to handle simulations such as finite element analysis; however, models and computational processes that are used in such simulations are becoming black boxes. Incorrect results might be adopted in the design if an engineer does not understand the characteristics and scope of application of the model. Such cases can lead to a serious accident such as destruction during construction or during the service of civil engineering / building structures.
Meanwhile, only the experimental results are often recognized as the truth when simulation results differ from those of experiments, and the simulation sometimes can be recognized as inadequate. Concrete is a composite material, and therefore, its behavior has variability in material level and boundary conditions and experimental results include.....

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