



Special Issue on
**Modeling, Identification, and Evaluation of
Corrosion-Induced Damage in Reinforced Concrete
Structures**

CALL FOR PAPERS

Corrosion of steel reinforcement embedded in concrete structures remains a scientific and technological issue unresolved well in various fields such as civil engineering, offshore engineering, transportation infrastructure, military facilities, and port structures. The causes of corrosion of steel reinforcement in concrete structures are broadly twofold. (i) The porosity of concrete material allows aggressive acid matter such as chloride, sulfide, and carbon dioxide from the surrounding environment to penetrate into the material. These penetrated matters neutralize the original alkaline environment of concrete formed during the cement hydration process, likely evoking the corrosion of steel reinforcement. (ii) Concrete has a natural characteristic of tending to crack due to both its material properties and external factors such as service loading and exposure conditions. Any crack can provide acid ions with a path to the surface of reinforcing bars, rendering them susceptible to corrosion. Accumulation of such corrosion may cause damage in reinforced concrete structures, which likely decreases the safety, reliability, and durability of the structures, even to the extent of causing catastrophic events. For these reasons, the alleviation, control, and sound treatment of corrosion-induced damage in reinforced concrete structures have for years been the focus of research, attracting increasing attention in scientific and technological milieus in various industrial areas.

We invite investigators to submit original research and review articles that treat various aspects of corrosion-induced damage in reinforced concrete structures, such as mechanisms, modeling, identification, evaluation, and maintenance. With the presentation of representative recent work, accomplishments in this field will be highlighted and directions for further research into the remaining challenges will be illuminated.

Potential topics include, but are not limited to:

- ▶ Exploration of mechanism of corrosion in reinforced concrete structures
- ▶ Numerical modeling and simulation of behavior of corrosion-induced damage
- ▶ Performance assessment of corrosion-affected reinforced concrete structures
- ▶ Reliability and durability analysis of reinforced concrete structures exposed to corrosive environments
- ▶ Identification and quantification of corrosion using vibration and wave theories
- ▶ Detection of corrosion-induced damage based on nondestructive testing
- ▶ Measurement and monitoring of the entire corrosion process in reinforced concrete structures
- ▶ Prediction of the service life of reinforced concrete structures subject to corrosion of steel reinforcement
- ▶ Maintenance decision-making for corrosion-affected reinforced concrete structures

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