

MODELLING THROUGH TESTING CORROSION OF REINFORCEMENT

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ABSTRACT

Structural concrete is the most widely used construction material due to its ease of fabrication on site, its relatively low cost and its mechanical performance and durability. The possible threats for its future are related to the different forms of environmental attack, among which the most economically detrimental is the corrosion of the reinforcement. This corrosion produces oxides at the steel/concrete interface which affects directly their bond, which is the composite essence of the material, in addition to produce a loss in steel section and ductility and produce the cracking of the concrete cover. Still there are not rules in Codes and standards on how to design for avoiding the corrosion or on how to assess existing structures when they are corroding, however, due to the progressive aging of the infrastructures the need of guidance is however increasing.

In recent years the modelling of the generation and progression of the steel corrosion is attracting wide interest among researchers and design engineers, in particular aspects like the calculation of the time to corrosion initiation, the crack generation after the initial corrosion steps, the decrease in steel/concrete bond and the structural strength of corroding elements in general.

The session calls for advances on these subjects in particular for calculation tools which were calibrated with experimental results.

REFERENCES

- [1] Anaya P., Martín-Pérez B., Rodríguez J., Andrade C.- Transfer length of corroded wires in prestressed concrete members- Structural Concrete no.1 (2022) pp-138-153.- DOI: 10.1002/suco.202100265
- [2] Belletti B., Rodríguez J., Andrade C., Franceschini L., Sánchez J., Vecchi F.- Experimental tests on shear capacity of naturally corroded prestressed beams- Structural Concrete October 2020 pp-1777-1793- DOI: 10.1002/suco.202000205