

## **Numerical analysis of corrosion cell in concrete**

**Gojko Balabanić**

*Faculty of Civil Engineering, University of Rijeka, Viktora Cara Emina 5, HR-51000 Rijeka,  
CROATIA*

**Nenad Bičanić**

*Department of Civil Engineering, University of Glasgow, Glasgow G12 8LT, SCOTLAND, U.K.*

**Andrija Đureković**

*Civil Engineering Institute of Croatia, Janka Rakuše 1, HR-10000 Zagreb, CROATIA*

### **SUMMARY**

The analysis of a corrosion cell in concrete was made by applying a numerical modelling procedure which has been developed for calculating the current distribution and oxygen concentration in a corrosion cell in concrete as well as its polarization characteristic. The electric potential in the electrolyte is calculated using the Laplace equation and the oxygen concentration by using the diffusion equation. On the cathode surface complex boundary condition is applied based on Faraday's law and in that way cathodic-ohmic control of the corrosion process is automatically taken into account. The spatial domain is represented by the cylindrical concrete specimen with the steel bar on its axis.

---