

## **Nonlinear Analysis of Reinforced Concrete Arched Structures Considering Soil-Structure Interaction**

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**Abstract :** Nonlinear analysis is one of the most important design and safety tools in structural engineering. Based on the finite-element method, a geometrical and material nonlinear analysis of large span reinforced concrete arches is carried out considering soil-structure interaction. The concrete section details and reinforcement distribution are taken into account. The behavior of soil is considered via Winkler's and continuum models. A computer program (NARC II) is specially developed in order to follow the structural behavior of large span reinforced concrete arches up to failure. The results obtained by the proposed model are compared with available literature for verification. This work confirmed that the geometrical and material nonlinearities, as well as soil structure interaction, have considerable influence on the structural response of reinforced concrete arches.

**Keywords :** nonlinear analysis, reinforced concrete arched structure, soil-structure interaction, geotechnical engineering

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