

# **Nonlinear finite element analysis of ferrocement beams.**

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## **Abstract**

Computational model based on the Timoshenko beam finite element formulation is developed using quadratic isoparametric elements with 3 degrees of freedom. This model is capable of tracing the entire flexural behavior of ferrocement beams of I-type and Box type using a Layered approach under monotonically increasing loads.

Ferrocement is modelled as a single material whose properties represent the integrated response of its constituents; mortar and wire mesh. The model thus allows for cracking, yielding and fracturing of ferrocement in tension and yielding and crushing of ferrocement in compression.

Nonlinear Problem is solved by using a full and modified Newton Raphson incremental interactive algorithms. The validity of the proposed analytical model is assessed by comparing the numerical results with the available experimental results. Comparisons are made for three types of ferrocements with 2, 3, and 4 layers of wire mesh. The effect of the presence of skeletal steel is also investigated.