

# **The Effects of Confinement and Strain Hardening on the Performance and Design of Short Circular Columns**

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## **Abstract**

In limit design of reinforced concrete structures, the design bending moment distribution is related to the ductility at plastic hinges. The past research has shown that the ductility and energy dissipation capacity of a reinforced concrete member can be improved significantly by confining the concrete by circular spirals. The ultimate curvatures of reinforced concrete sections cannot be calculated accurately by neglecting strain hardening (if strain hardening is formed) in steel. In such a case, the reliability of the limit design and seismic design may be affected unfavourably. In this context, based upon an appropriate steel behaviour model including strain hardening, an algorithm can be developed for confined circular column sections.

**KEYWORDS:** Short Columns, Design, Circular Section, Strain Hardening