SEISMIC BEHAVIOR AND REPAIR OF STEEL FIBER REINFORCED CONCRETE BRIDGE COLUMNS

By
ABDEL-RAHMAN MOHAMED NAGUIB ABDEL-RAHMAN

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
STRUCTURAL ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

“SEISMIC BEHAVIOR AND REPAIR OF STEEL FIBER REINFORCED CONCRETE BRIDGE COLUMNS”

Key Words:
(Steel fibers; Hysteretic behavior; Bridge columns; Ductility; Quasi-static tests; Seismic demands; Repair; Carbon fibers)

Summary:

The study explores the efficiency of using steel fiber reinforced concrete (SFRC) in bridge columns which resisting earthquakes. This was achieved by investigating the hysteretic behavior of scaled bridge columns via quasi-static tests of repeated lateral loads in presence of axial compressive force. Curves for estimating some seismic demands were constructed when using SFRC in bridge columns. The repair of seismic damage was studied on some of the previously tested samples using carbon fibers. Results showed the benefit of using steel fibers in reinforced concrete.
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