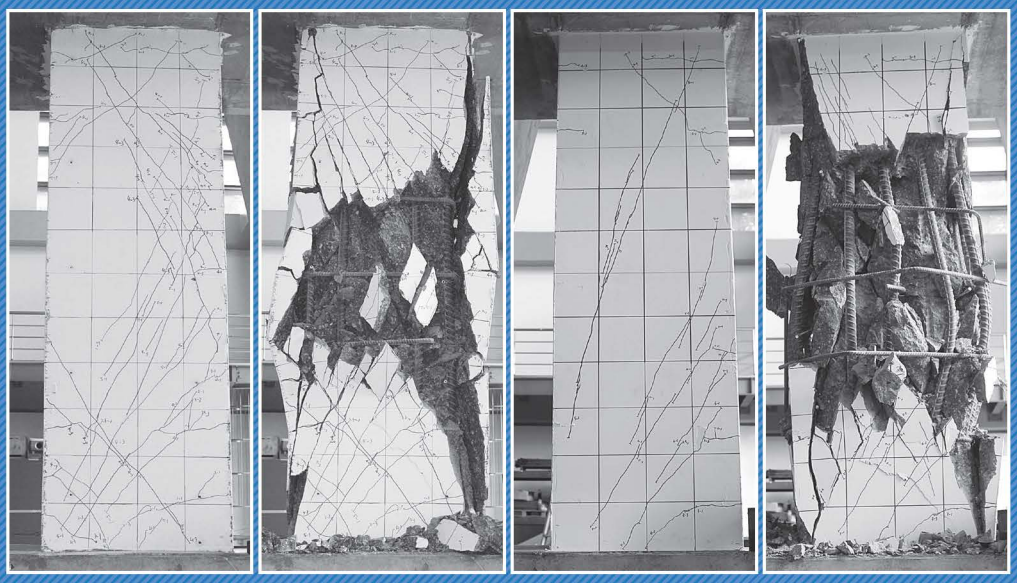

Reinforced Concrete Columns with High Strength Concrete and Steel Reinforcement

Editor:
Halil Sezen

American Concrete Institute®
Advancing concrete knowledge

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First printing, September 2013

DISCUSSION of individual papers in this symposium may be submitted in accordance with general requirements of the ACI Publication Policy to ACI headquarters at the address given below. Closing date for submission of discussion is February 2014. All discussion approved by the Technical Activities Committee along with closing remarks by the authors will be published in the May-June 2014 issue of either ACI Structural Journal or ACI Materials Journal depending on the subject emphasis of the individual paper.

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Printed in the United States of America

Editorial production: Leon G. Faulkender

Library of Congress Control Number: To be provided before publication
ISBN: 0-87031-843-8
ISBN-13: 978-0-87031-843-6

PREFACE

Practicing engineers increasingly favor use of high-strength concrete and reinforcement in their design. This is especially true for high rise building projects, where usable space can be increased when column size is significantly reduced in lower floors. Use of high-strength materials, however, is limited by the American Concrete Institute (ACI) and in other parts of the world, more specifically in high seismic regions. The main objective of this Special Publication is to present results from recent research studies and examples of practical applications and use of high-strength concrete and steel reinforcement in recent projects.

Authors of all papers included in this Special Publication presented their research during a two-part technical session at the 2012 ACI Fall Convention in Toronto, Canada. The session was sponsored by ACI Committee 441, Reinforced Concrete Columns. The first paper by Kimura et al. presents design issues related to application of high-strength materials in high rise reinforced concrete (RC) buildings including columns. Hwang et al. presents experimental data from full-scale RC column specimens constructed with high-strength concrete and reinforcement. Confinement effects and lateral drift capacity of columns are studied. Rautenberg and Pujol present results from a suite of numerical analyses designed to investigate the effects of high-strength longitudinal reinforcement on overall building frame response. Marvel and Hindi investigate the behavior of high-strength RC columns confined with cross spiral. Bae and Bayrak examine various compressive stress block parameters for high-strength concrete. Billah and Alam present results from seismic fragility analysis of columns and frames with high-strength concrete and steel. Burrell et al. present experimental results from high strength RC columns constructed with compact reinforced composite and tested under simulated blast loading. Hassan et al. investigate experimental performance of high-strength concrete columns under biaxial bending and strengthening by fiber-reinforced polymer (FRP) laminates. Mostafaei summarizes a new fire testing technology with a focus on the structural response of a high strength column with steel fibers. Ou et al. investigate the shear behavior of high-strength RC columns and evaluate ACI 318 shear strength equations for high-strength concrete and reinforcement.

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