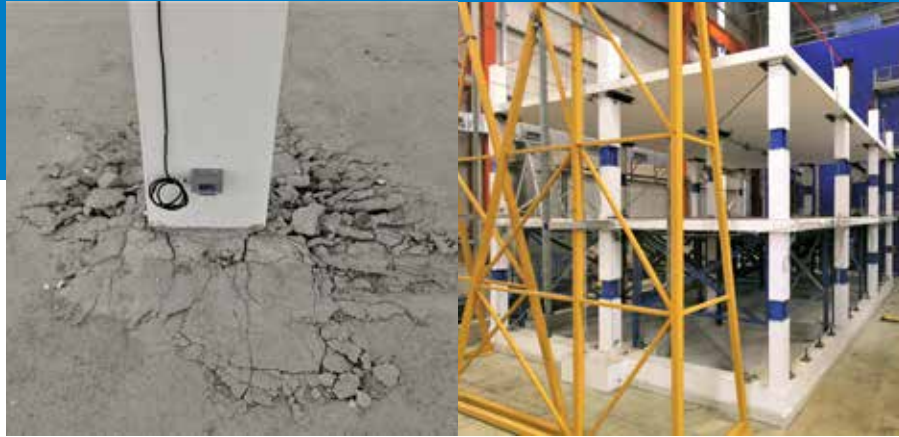


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Design of Slabs for Serviceability and Punching Shear Strength: Honoring Professor Amin Ghali

SP-353

Editors:
Mustafa Mahamid and Ramez B. Gayed



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Design of Slabs for Serviceability and Punching Shear Strength: Honoring Professor Amin Ghali

The purpose of this symposium and special publication is to recognize and honor Professor Amin Ghali's outstanding long-term dedication to the concrete industry. Dr. Ghali obtained his B.Sc. and M.Sc. degrees in Civil Engineering from Cairo University, Cairo, Egypt, respectively in 1950 and 1954, his Ph.D. from Leeds University, England in 1957. He spent ten years in engineering practice before joining at the University of Calgary, AB, Canada as a professor in 1966. Dr. Ghali has developed the revolutionary, multi-patented and globally used, headed-stud shear reinforcement systems for concrete flat slabs; he has been a consultant for a number of major international structures, including offshore structures, multi-story buildings, bridges, and tanks. Dr. Ghali authored over 300 papers and eight patents. In 15 editions and 6 translations, his books include: Structural Analysis Fundamentals (2022), Structural Analysis: A Unified Classical and Matrix Approach (2017), Circular Storage Tanks and Silos (2014), and Concrete Structures: Stresses and Deformations (2012).

Professor Ghali has served the industry in many ways, including his role as a voting member of ACI Committee 435, Deflection of Concrete Building Structures, 343, Concrete Bridge Design, and 421, Design of Reinforced Concrete Slabs. Jointly with associates at University of Calgary, his research on punching shear design and control of long-term deflection enables design of affordable concrete floors. Dr. Ghali served as expert, providing technical testimony, for a number of complicated engineering cases. Dr. Ghali received a number of teaching and research excellence awards over his long career, and was elected a Fellow of ACI, ASCE, CSCE, and CAE; in 2017, he received the Top 7 Over 70 Award for his outstanding continued research and engineering contributions.

The papers found in this SP publication encompass a broad overview on the important issues related to punching shear resistance and sustainable serviceability of flat plates from both a theoretical and design perspectives. These papers formed the basis of presentations made at the Amin Ghali Symposium on Design of Structural Concrete Slabs for Safety Against Punching and Excessive Deflection held at the ACI Fall 2020 Virtual Convention, on October 25, 2020. Twelve presentations were made in two sessions by those who have worked closely with Dr. Ghali in his areas of interest. The SP includes nine papers on design of concrete floors for punching and for serviceability. The sessions were sponsored by ACI Committee 421, Design of Reinforced Concrete Slabs.

All papers in this publication were reviewed by at least two recognized experts in accordance with ACI review procedures. Special thanks are extended to all who helped to make the two technical sessions and accompanying publication a success.

Editors
Mustafa Mahamid
Ramez B. Gayed

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**Harmony of Provisions of American Concrete Institute Publications:
ACI 318-19 Code and ACI Committee Guides**

Ramez B. Gayed, Mustafa Mahamid and Neil Hammill

Synopsis: Design of structural concrete for strength and serviceability relies on provision requirements in ACI 318-19 Code and ACI Committee guides. Writers of these documents seek to observe harmony of the provisions within individual documents and in other ACI documents. However, ACI 318-19 has a few controversial provisions. The current paper highlights and proposes remedies of specific provisions related to slab design for shear strength and serviceability.

Keywords: concrete slabs; critical section; deflection; flat plate; flexure; punching shear; reinforcement ratio; serviceability; strength; yield-line.