

# Shear design and evaluation of concrete structures

Professor Michael P. Collins, University of Toronto



## Abstract

Deficiencies in the shear design of concrete structure are inherently more dangerous than deficiencies in flexural design because shear failures can occur with no prior warning and with no possibility for redistribution of internal forces. While accurate assessment of the shear capacity of a reinforced concrete structure is critically important for public safety, the traditional techniques available for this task are open to dispute. For determining flexural capacity engineers can use the simple, accurate, general and internationally accepted "plane sections theory". However,

for finding shear strength engineers typically rely on restricted empirical equations whose applicability and accuracy are sometimes very questionable. In this presentation research aimed at understanding the basic mechanisms of shear transfer is summarised and simple, rational and general shear design and evaluation procedures are introduced.

## About the presenter

Professor of Civil Engineering at the University of Toronto, Michael Collins has made outstanding contributions to the field of structural engineering as an educator, researcher and consulting engineer. Michael's teaching acumen has garnered him many awards including the Canadian Council of Professional Engineers' Medal for Distinction in Engineering Education. His analytical and experimental research contributions on the shear behaviour of reinforced concrete and particularly his Modified Compression Field Theory have received international recognition and have been incorporated into the design specifications of Canadian, American and European Standards. He has authored or co-authored two books and written chapters in nine further books.

Michael's consulting experience includes work on concrete offshore platforms, high-rise buildings, bridges, dams and industrial facilities. Further he has been involved in a number of failure investigations. He has been elected Fellow of the Canadian Academy of Engineering, The Engineering Institute of Canada as well as the Royal Society of Canada on the basis of "exceptional contributions to Canadian intellectual life". For his research on shear he has been awarded "Honorary Membership" ("the Institutes highest honor") and five best-paper awards by the American Concrete Institute.

## Christchurch, Wednesday July 9

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|-----------|--|---------------------------|
| Programme | 5.30pm – 6.00pm  |                           |
|           | 6.00pm – 7.00pm  | Professor Michael Collins |
| Venue     | Civil Engineering Department, Staff Common Room (E120)<br>University of Canterbury, Christchurch |                           |