

CE 890 Graduate Seminar

- SPEAKER:** Abdul-Halim Halim
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(Advisor: Dr. Asad Esmaily)
- TOPIC:** “Evaluation of Shear and Shear/Torsion using AASHTO LRFD & ACI Approaches”
- DATE:** October 6, 2010
- TIME:** 4:00 p.m. (refreshments at 3:45 p.m.)
- PLACE:** 1052 Rathbone Hall

ABSTRACT

The shear and combined shear and torsion provisions of the AASHTO LRFD (2008) Bridge Design Specifications, as well as simplified AASHTO procedure for prestressed and non-prestressed reinforced concrete members were investigated and compared to their equivalent ACI 318-08 provisions. Response-2000, an analytical tool developed based on the Modified Compression Field Theory (MCFT), was first validated against the existing experimental data and then used to generate the required data for cases where no experimental data was available. Several normal and prestressed beams, either simply supported or continuous were used to evaluate the AASHTO and ACI shear design provisions.

In addition, the AASHTO LRFD provisions for combined shear and torsion were investigated and their accuracy was validated against the available experimental data. These provisions were also compared to their equivalent ACI code requirements. The latest design procedures in both codes propose exact shear-torsion interaction equations that can directly be compared to the experimental results by considering all ϕ factors as one. In this comprehensive study, different over-reinforced, moderately-reinforced, and under-reinforced sections with high-strength and normal-strength concrete for both solid and hollow sections were analyzed. The main objectives of this study were to:

- Evaluate the shear and the shear-torsion procedures proposed by AASHTO LRFD (2008) and ACI 318-08
- Validate the code procedures against the experimental results by mapping the experimental points on the code-based exact interaction diagrams
- Develop a MathCAD program as a design tool for sections subjected to shear or combined shear and torsion