

CE 890 Graduate Seminar

- SPEAKER:** Steven Hammerschmidt, M.S. graduate student
(Advisor: Dr. Bob Peterman)
- TOPIC:** “Assessing Damage Potential in Concrete Bridge Members”
- DATE:** October 20, 2010
- TIME:** 4:00 p.m. (refreshments at 3:45 p.m.)
- PLACE:** 1052 Rathbone Hall

ABSTRACT

With the aging and deterioration of bridges, the evaluation of the existing condition of the structural elements becomes vital to the engineer and public officials when deciding how to repair or replace the structure. The ability to obtain the necessary information on the condition is often too expensive and time consuming especially for rural bridges on county roads, where many existing bridges are structurally deficient and in need of repair. The current method involves mounting strain gages on structural elements, loads travel across the structure, and the changes in strain due to the applied loads are measured. While these methods are accurate, they only measure the change in strain due to the applied loads and not the initial or pre-existing strains.

A method of surface strain relief was developed to measure the initial strains in the members. The method involved mounting a linear electrical-resistance strain gage along the axis of maximum stress, coring around the gage to relieve the strain, and then relating the change in strain to the corresponding stress in the member. The research was broken up into two phases, Phase I and Phase II. Phase I developed the procedure for the surface strain relief method, and tested different depths of cores and related the change in strain to the theoretical change in strain. Finite element models were created to verify the results. Phase II used the surface relief strain method and tested pretension members with know prestressing force and compared the measured change in stain to the theoretical stain.