

CE 890 Graduate Seminar

- SPEAKER:** Hakan Yasarer, M.S. Student
- TOPIC:** “Characterizing the permeability of concrete via neural network approach”
- DATE:** April 8, 2009
- TIME:** 4:00 p.m. (refreshments at 3:45 p.m.)
- PLACE:** 2144 Fiedler Hall

ABSTRACT

Reliable and economical design of Portland Cement Concrete (PCC) pavement structural systems relies on various factors, among which is the proper characterization of the expected permeability response. Permeability is a highly important factor which strongly relates the durability of pavement systems to changing environmental conditions.

To properly characterize the permeability response of PCC pavement structure, Kansas Department of Transportation (KDOT) generally runs Rapid Chloride Permeability test to determine the resistance of concrete to water, chloride and other chemicals as well as Boil test to determine the density, percent absorption, and percent voids in hardened concrete. Rapid Chloride Test typically measures the number of coulombs passing through a concrete sample over a period of six hours at a concrete age of 7, 28, and 56 days. Boil Test measures the volume of permeable pore space of the concrete sample over a period of 5 hours at a concrete age of 7, 28, and 56 days.

In this research, Artificial Neural Network (ANN)-based permeability response prediction models for Rapid Chloride and Boil tests are developed by using the data provided by KDOT to reduce the duration of the testing period. The presentation will discuss: the procedure of Rapid Chloride and Boil tests, developed models, and prediction accuracy comparisons.