CE 890 Graduate Seminar

We have two presentations this week:

DATE: May 5, 2010
TIME: 4:00 p.m. (refreshments at 3:45 p.m.)
PLACE: 2144 Fiedler Hall

SPEAKER: Sharmin Sultana   (Advisor: Dr. Mustaque Hossain)
TOPIC: "Extending Life of Asphalt Pavements on Low Volume Roads
with Thin Whitetopping"

ABSTRACT

Whitetopping is the process of rehabilitating asphalt concrete (AC) pavements using a concrete overlay. A thin overlay is commonly known as Thin Whitetopping (TWT). In this study, the finite element (FE) analysis of a TWT was performed with SolidWorks, a 3-D FE software program. The TWT-overlaid pavement was modeled as a three-layer pavement system- TWT, AC layer and subgrade. The traffic load was modeled as a constant pressure over a rectangular area at the surface and with intensity equal to the tire inflation pressure of 100 psi. The analyses were conducted for different bonding condition at the interface of the TWT slab and the AC layer, existing AC layer modulus and shoulder condition (tied and paved PCC or unpaved). The expected lives of TWT overlays were estimated for different stress ratios using equations developed by the Portland Cement Association (PCA). The results show that very high service lives of TWT- overlaid AC pavements on low volume roads can be obtained if good interface bonding between TWT and existing AC pavement can be ensured.

SPEAKER: Md. Shahidul Islam   (Advisor: Dr. Mustaque Hossain)
TOPIC: "Chip Seal with Lightweight Aggregates"

ABSTRACT

Chip seal is widely used for preventive maintenance of flexible pavements in many states including Kansas. Although there are no distinct design guidelines for using lightweight aggregates in chip seals, these aggregates are extensively used in Kansas to limit windshield damage due to flying chips. In this study, lightweight aggregates were used with polymer-modified asphalt emulsion to determine proper aggregate and emulsion application rates to minimize chip loss for longer-lasting chip seals on flexible pavements. A statistical analysis was conducted to evaluate chip seal performance characteristics that include aggregate retention, aggregate embedment depth, and rutting. Results show that aggregate retention and embedment depth depend on aggregate-emulsion interaction where as rutting depends on the type of aggregates used.