

## **CE 890 Graduate Seminar**

**SPEAKER:** Patrick Sheedy (Dr. Peterman's M.S. student)

**TOPIC:** "Alleviating Concrete Placement Issues Due to Congestion of Reinforcement in Post-Tensioned Haunch Slab Bridges"

**DATE:** April 29, 2009

**TIME:** 4:00 p.m. (refreshments at 3:45 p.m.)

**PLACE:** 2144 Fiedler Hall

### **ABSTRACT**

Over the past decade, Post-Tensioned Haunch Slab (PTHS) bridges have been constructed in Kansas for the Kansas Department of Transportation (KDOT). Due to the nature of the post-tensioning, excessive reinforcement is required for the PTHS bridges, especially for the anchorage points at the abutments. KDOT has had problems in the past with the abutments "blowing out" during the post-tensioning procedure due to poor consolidation of the concrete. To rectify this situation, KDOT wants to use a hybrid concrete mix consisting of Self-Consolidating Concrete (SCC) and conventional concrete.

A concrete mix design was developed and tested for both SCC and conventional concrete. A target spread of 24" was set for the SCC and a target slump of 4" was set for the conventional concrete. Various concrete properties were measured to achieve the optimum mix designs. When the final mix designs were completed, tests were performed to measure the bond of the two concretes to each other. Composite blocks of concrete were cast, cored, and the splitting-tensile strength of the resulting 6" x 12" cores was tested. Shear friction pushoff specimens were made to test the concretes interface in shear. Several different parameters were set to achieve a variety of results. Seven different sets of pushoff specimens were made, with a grand total of 84 specimens being cast and tested. All specimens had either an uncracked, precracked, or cold-joint interface.