

Project Title:

Self-Compacting Concrete using Recycled-Concrete Aggregate

Investigator: Jiong Hu**Department:**

Department of Engineering Technology

Project Summary:

A preliminary study has been conducted to evaluate the feasibility of using recycled concrete aggregate (RCA) in self-compacting concrete (SCC). Two different sources of RCA were collected and used in proportioning SCC with different levels of replacement of natural aggregate. Physical properties such as specific gravity, gradation, absorption and abrasion resistance of RCA were measured. Concrete performance including flowability, strength, shrinkage, and rheological properties were evaluated during this study. Effects of different percentage of RCA replacement, and concrete mix design on SCC performance were studied. Results showed that with appropriate mix design, it is possible to use RCA to obtain concrete with the comparable properties as SCC using natural aggregate. Guidelines for using RCA in SCC and recommendations for further study were provided based on the experimental study. The success of this research will not only encourage the use of RCA in concrete area, but also extend the use of SCC in construction. Results also indicated that further study is needed for rational mix design methods and long term performance including shrinkage, and durability of this new kind of concrete.

Publications:

N/A. (A manuscript titled “Self-Compacting Concrete using Recycled-Concrete Aggregate” to be submitted to Journal of Solid Waste Technology and Management is currently under preparation)

Presentations:

N/A

External Grants Applied:

J. Hu, "Improvement of Self-Consolidating Concrete Mix Design Methodology Based on Rheological Performance and Raw Material Characterization", Conceptual Proposal Submitted to RMC Research & Education Foundation (NRMCA), Submitted August 2009, Amount \$70,837

J Hu, D. Hahn, W. Rudzinski, C. Powell, N. Guven, S. Lee, and G. Beall, "Evaluation, Presentation and Repair of Microbial Acid-Produced Attack of Concrete", Project sponsor(s): TxDOT (RTI 0-6137), Submitted March 2009, Amount \$252,557

External Grants Awarded:

J Hu, D. Hahn, W. Rudzinski, C. Powell, N. Guven, S. Lee, and G. Beall, "Evaluation, Presentation and Repair of Microbial Acid-Produced Attack of Concrete", Project sponsor(s): TxDOT (RTI 0-6137), Funded August 2009, Amount \$252,557, 09/2009 - present

Student Number: 2