

**USE OF RESIDUAL SOLIDS FROM PULP AND PAPER MILLS FOR
ENHANCING STRENGTH AND DURABILITY OF READY-MIXED
CONCRETE**

--Year 2, Second Quarter

By Tarun R. Naik, Yoon-moon Chun, and Rudolph N. Kraus

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ABSTRACT

The Second Quarter's activities for Year 2 (April 1, 2001 to June 30, 2001) of the US-DOE Project Agenda 2020, "Use Of Residual Solids From Pulp And Paper Mills For Enhancing Strength And Durability of Ready-Mixed Concrete," are reported here.

Concrete mixtures were made using C1, C2, WG, and WV residual solids. Residual contents of the mixtures were 0% (reference) and 0.65%. The concrete mixtures were proportioned to have comparable compressive strength. Tests conducted for the concrete were: time of setting, compressive strength, durability and long-term tests (resistance to rapid freezing and thawing, length change, scaling resistance to deicing chemicals, resistance to chloride ion penetration, abrasion resistance), and flexural toughness. Fabrication of beam molds and loading apparatus for flexural toughness test was completed. An initial set of mixtures for the evaluation of time of setting, durability, and flexural toughness of concrete containing I, S, and BR residual were made with I, S, and BR residuals at residual contents of 0 %, 0.35 % and 0.65 %. The objective was to produce residuals concrete of comparable workability and strength with that of the reference concrete.

A market survey was also finalized as part of the work of this quarter, and distributed to 360 ready-mixed concrete producers and affiliated members of the National and state ready-mixed concrete associations. The survey assessed the potential market for residual fibers in concrete as well as establish preliminary pricing information needed to conduct the economic impact of using these sources of fibers. Results of the responses were compiled and the data analyzed. Based upon the results of the survey, economic impact information was compiled for each state having a significant pulp and paper industry. The economic impact of full implementation of residual solids in concrete would exceed \$400 million dollars per year in the U.S.