Establishing a Center for Concrete Research

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The National Ready Mixed Concrete Association established a research facility as early as 1928. This research laboratory has been dedicated to concrete and aggregate research and industry training and certification programs ever since. Pioneering work by the association, as directed by its committees, has helped establish many of the standards and specification requirements for ready mixed concrete. The primary focus of NRMCA's research activities has always been on practical issues that benefit or impact the industry. These have included improvement of standards, material evaluation, troubleshooting and developing tools and methods to enhance the quality, predictability and uniformity of ready mixed concrete and aggregates for construction. The research and technical activities of NRMCA established its credibility and respect early with the strong leadership of people like Stanton Walker, Delmar Bloem, Richard

A research cooperation agreement was signed on May 10, 2004 between The University of Maryland, Department of Civil and Environmental Engineering (UM-CE) and NRMCA towards establishing a Center for Concrete Research (CCR). The intent is to use the synergies of the academic community with the established NRMCA research laboratory to conduct applied research that benefits the industry. The agreement is expected to be mutually beneficial for both parties and there is potential for adding other organizations in the future. The agreement was signed by James Russ, NRMCA past chairman, on behalf of NRMCA and Dr. Ali Haghani, professor and chair of the Department of Civil and Environmental Engineering on behalf of UM-CE. Robert Garbini, Colin Lobo, Karthik Obla from NRMCA and Dimitrious Goulias from UM-CE were also present.

Gaynor, Richard Meininger and Jon Mullarky. In 1998, the research and technical contributions of the NRMCA research program were recognized by the American Concrete Institute with the prestigious Arthur R. Anderson Award. Beyond technical issues and standards, the laboratory supports NRMCA initiatives in promotion, regulatory compliance and operations areas.

The NRMCA research facility has been located in College Park, Maryland, about 2 miles from the University of Maryland campus, since 1974. The research facility is supported by the members of the association and represents a benefit of membership in the NRMCA. This benefit is through the development of technical data that supports industry initiatives and the availability of the research facility for member product evaluations or consulting services at below market prices.

The research facility consists of a 5000-square-foot building that maintains resources for standard and innovative testing of concrete and aggregate. The building has two strength testing machines and four environmentally controlled rooms for curing and testing materials under controlled temperature and moisture conditions. The NRMCA research laboratory participates in proficiency sample testing of the Cement and Concrete Reference Laboratory (CCRL), is inspected biannually for conformance to the requirements of ASTM C 1077 and maintains its accreditation under the AASHTO Laboratory Accreditation Program.

As industry pressures and initiatives have increased in the areas of concrete promotion, education and advocacy on the legislative and regulatory fronts, NRMCA has responded by elevating professional expertise in those areas. This has caused a reevaluation and some degree of constraint on the research initiatives. Simply put, the research facility has to generate revenue in addition to member support to elevate its resources and capabilities. The industry's commitment to research and education, however, is clearly demonstrated in the pledges of approximately $14 million to the RMC Research Foundation and the projects currently being funded by that organization.

NRMCA is currently working on establishing a Center for Concrete Research (CCR). As currently proposed, the CCR will be a consortium between NRMCA, the University of Maryland (UM) and the Middle Tennessee State University (MTSU). Interest of the participation of other universities in the CCR is being solicited. A concrete research consortium that partners industry initiatives with academia is seen to be of mutual benefit. The CCR will have a clear understanding of technical issues facing the industry through the direction of the NRMCA's Research, Engineering and Standards (RES) Committee and the participation of its engineering division staff in standards-setting organizations. Academic institutions bring with them their research expertise and ability to solicit research grants from other organizations that funds the education of graduate and undergraduate students. This synergy ensures that the participating academic institutions are connected to industry needs and develop research initiatives that will have an immediate impact and benefit to the industry. Students working on these research programs are also more tuned in to the concrete industry, will likely join its workforce and thereby elevate its technical competence and credibility.

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The primary goal of the CCR is to become nationally recognized for its expertise in *applied* concrete research. Applied concrete research here is defined as that research that will have an impact on the ready mixed concrete industry in the short term of less than four years. Examples of current topics of interest are: self consolidating concrete; concrete maturity; optimizing mix designs for performance; effects of aggregate grading and other characteristics; evaluation of new methods for acceptance such as the air void analyzer or microwave oven test; predicting setting characteristics of concrete; alkali silica reactivity tests; pervious concrete; effects of aggregate fines; concrete mixtures for sustainability; sorptivity and other tests to evaluate durability/cracking; and reuse of returned or recycled concrete and wash water. The ready mixed concrete industry needs to have a framework and a resource, represented by the proposed CCR, to address these technical issues that continually arise. Technical data

provides a stronger basis to support industry positions than opinions or conjecture. Credible and unbiased technical data ensures a proper dialogue in lieu of being dictated to. The CCR will focus on those topics that are most likely to influence the ready mixed concrete industry in a significant way within the next four years. It will help build industry positions on these technical issues as well as foster a positive technical change in the ready mixed concrete industry. In addition, CCR will also research topics that save cost, increase market share, or provide educational value for the ready mixed concrete producer.

NRMCA member companies will substantially gain from CCR's work. Some potential member benefits are:

a. High quality research reports on state-of-the-art subjects that will impact a member company's business practice.
b. Help formulate industry positions on important issues that progress the ability of the industry to be more in control of the product they produce.
c. Members can use the CCR reports for marketing purposes.
d. Research results can potentially reduce cost to the industry and increase concrete market share.
e. Develop educational information of value to the industry and its customers.

As the ready mixed concrete industry has progressed to a higher level of technical competence and product development, the argument has been made that individual companies can work on these initiatives themselves. The reality is that the laboratory facilities of most companies have their hands full with daily QA-QC activities, trouble shooting and product development for their specific needs and do not have time or resources to devote to initiatives or research that will have an overall impact on the concrete industry. When they do spend time on these initiatives they would only benefit from the CCR's work that will surely shorten their learning curve. One example is the NRMCA's research on the reuse of wash water that has to translate to a company's specific materials and production processes.

In addition, CCR will offer other member benefits that are equally important. They are:

a. High quality consulting testing at below market costs for members, thus helping them reduce costs. Many members cannot perform these tests.
b. Educate industry personnel and testing technicians for industry certification programs and promote the development of performance-based concrete mixtures.

CCR's programs will be jointly managed by NRMCA's engineering staff and UMD with substantial input from NRMCA's RES committee. Apart from significant investments from NRMCA, CCR will depend upon funding from sources such as the RMC Research Foundation and external agencies such as state and federal highway agencies and other opportunities available to the university partners. If you are interested in the planned activities of CCR, please contact NRMCA's Colin Lobo at clobo@nrmca.org or Karthik Obla at kobla@nrmca.org. ■