



FOUNDATION WORK SUPPORTS THE PRESCRIPTIVE-TO-PERFORMANCE (P2P) INITIATIVE

The RMC Research & Education Foundation has funded a great deal of work that supports the Prescriptive-to-Performance (P2P) Initiative for the benefit of the public and industry. With performance-based specifications, the producer is challenged to be innovative and to optimize materials for intended performance. Prescriptive specifications hamper creativity, and often impede sustainable solutions such as the use of recycled materials in concrete.

Below is a summary of some of the key projects completed and underway to advance P2P. In addition to those listed below, the Foundation has also funded programs to develop faster and more accurate test methods, and education programs for producers and plant inspectors, all of which will help establish credentials and criteria for meeting performance-based specifications.

Preparation of a Model Performance-Based Specification - Creates a framework for specifiers to use in specifying for performance versus a prescriptive specification by performing a comprehensive global review of current performance specifications and criteria used for concrete. Includes a presentation of findings; model specification language as performance-oriented as possible given the present state-of-the-art and current limits of technology; and identification of the steps needed in the development of a rapid and reliable means of confirming specified performance.

Experimental Case Study Demonstrating the Advantages of Performance-Based Specifications - A laboratory study designed to show the advantages of performance-based criteria over prescriptive requirements in concrete specifications. Typical specifications for two types of applications – warehouse floors and bridges – and the ACI 318 code durability provisions were chosen. Specifications for these applications are generally prescriptive in nature. Concrete mixtures were prepared according to the prescriptive provisions of these specifications and compared to mixtures that satisfy intended performance attributes. Fresh and hardened concrete properties were quantified and compared. Three experimental case studies were obtained to quantify the benefits and optimized cost of concrete mixtures furnished under performance-based specifications. The study also identifies performance-based alternatives and criteria to prescriptive requirements in the selected applications. The case studies continue to be used in presentations by the P2P Steering Committee and clearly identify the advantages of the performance design specification over prescription.



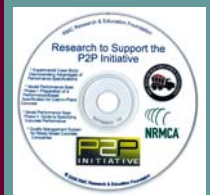
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Quality Management System for Ready Mixed Concrete Companies - A guideline document for a ready mixed concrete producer to use in developing an internal Quality Management System (QMS). The goal is to create a quality management standard that establishes the credentials of a ready mixed concrete producer to bid on and furnish concrete on performance-based criteria. The project includes a comprehensive set of guidelines for various aspects impacting quality so that a producer can assure the purchaser that a uniform and consistent product is capable of being designed, produced and delivered. The QMS guidelines are specific to ready mixed concrete production and include a review of current industry standard requirements such as in ACI, ASTM, AASHTO, ISO 9000, and NRMCA. The QMS guidelines are supported by an example Quality Manual of a fictitious company that documents procedures that support quality. The P2P Steering Committee will use these guidelines as the basis of developing a producer qualification system to support the P2P Initiative.

Evaluation of Performance-Based Alternatives to the Durability Provisions of ACI 318 Building Code - The study, which is underway the NRMCA Lab, will attempt to establish tests and criteria for concrete by pre-qualification, jobsite testing, and providing guidance to concrete producers on designing for a minimum level of performance to reduce the risk of failing performance criteria. Developing performance-based alternative criteria to current prescriptive limitations in the ACI 318 Building Code will significantly advance P2P. It will allow for an increased use of performance specifications while eliminating restrictions on minimum cementitious contents/types, maximum w/cm ratios and required supplementary cementitious material quantities. The data from this study will be used by NRMCA to support code change proposals to the ACI 318 Building Code for Structural Concrete for performance-based alternatives to current prescriptive requirements. The study will also support performance-based alternatives to the American Association of State Highway Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Specifications. *The study is now part of a \$1.4 million study co-funded by the Federal Highway Administration and state DOT pooled resources fund, adding further credibility and leveraging industry resources.*

Creation of an ACI Report Addressing the Development and Proper Use of Performance-Based Criteria for Concrete - The RMC Research & Education Foundation is funding the work of Innovation Task Group 8 through the American Concrete Institute (ACI) to develop a report outlining the proper use and specifications for performance-based criteria for concrete. The report will quantify specific recommended changes which ultimately may affect changes in ACI 318 and other ACI standards allowing for the use of performance-based criteria. This report will be the culmination of all previous P2P work and will advance the acceptance of P2P through the framework of ACI.



The Foundation's existing P2P work has now been consolidated into a CD. Please contact Julie Garbini at jgarbini@rmc-foundation.org or 240-485-1150 for a copy.