

What Do We Mean by Performance Specifications?

An Update on the P2P Initiative

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The NRMCA P2P Steering Committee has been working since 2002 on the P2P Initiative to evolve concrete specifications from prescription to performance. Some of the completed work is available at www.nrmca.org/p2p. The P2P Steering Committee recently reviewed and updated its strategic plan in light of recent progress. An important goal added is to develop a clear link between performance specifications and sustainable development as these two activities are synergistic.

The committee has spent time discussing what we mean by performance requirements for concrete as there is some difference of opinion on this. Clearly, the ready mixed concrete producer cannot bear responsibility for aspects of concrete construction beyond its control and thereby cannot assume responsibility for the service life of a structure when furnishing concrete for a performance-based specification. The following *definition* was agreed upon by the committee:

A performance specification for concrete materials establishes performance indicators measured by standard test methods with defined acceptance criteria stated in contract documents and with no accompanying restrictions on concrete mixture proportions. It can include requirements for concrete pertinent to a defined ACI 318-08 (or similar) exposure class for durability even if the provisions are prescriptive. Unless otherwise permitted, it is assumed that the component materials used for performance-based concrete mixtures comply with industry standards. It is preferred that properties of plastic concrete required for constructability be established between the concrete contractor and the supplier and indicated to the design professional in a submittal.

The definition stems from the following assumptions on responsibility:

- The responsibility of the design professional is to understand the owner's needs, design the structure for service conditions and in compliance with locally adopted code and develop project specifications and contract documents.
- The responsibility of the contractor is to comply with the project specifications/contract documents. The contractor should provide pertinent specification requirements to the concrete supplier and state additional requirements needed to place and finish the concrete.
- The responsibility of the concrete supplier is to develop a mixture and furnish concrete in accordance with the requirements of the purchaser.
- The responsibility of the inspection agency is to ensure that concrete materials and construction are in compliance with the contract and to conduct testing in accordance with industry standards.

From the preceding, a performance specification establishes measurable and enforceable criteria in contract documents to be met by the contractor and the concrete supplier, within the limits of the delegated responsibility. The contractor and supplier may take on additional responsibility and risk with performance specifications and therefore should be given the necessary authority or freedom on proportioning concrete mixtures and construction means and methods. A certain level of competence is assumed, and it is recognized that some potential entities may not be adequately proficient or be willing to take on an increased level of risk and thereby liability.

By establishing this definition and outlining responsibilities, it is further noted

that performance specifications cannot place responsibility on the contractor or concrete supplier on the performance of the concrete in service conditions or relative to its service life since that is a design function and not within the expertise or responsibility of the contractor or concrete supplier. In some cases, however, such design responsibility may be delegated to a team in non-traditional contracts, such as design-build.

Some ongoing activity on the P2P Initiative:

- Completion of a report by ACI Innovative Task Group (ITG) 8 on performance requirements for concrete materials;
- Formation of an ACI technical committee to approve the ITG 8 report and adopt it as an ACI Committee document and to make recommendations to ACI standards. (ACI will potentially approve the formation of this committee at its Fall 2009 convention);
- Develop a white paper on the synergy between performance specifications and sustainable development;
- Develop a specification in MasterSpec format with recommendations to minimize prescription and suggest performance alternatives;
- Develop guidance on coordinating requirements between concrete producers and contractors on performance-based projects; and
- State highway pooled fund research study involving the NRMCA Research Laboratory to develop reliable test and criteria for permeability of concrete. ■

Contact the NRMCA Engineering Division at (240) 485-1160 to get involved and help make progress on the P2P Initiative.

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Goal 1: Partnering

Establish effective partnerships with stakeholders for broad acceptance.

Strategies

1. Establish working group with engineers to demonstrate benefits and achieve acceptance;
2. Partner with contractors to work together with concrete producers on performance-based alternatives;
3. Establish initiatives to support successful working relationships between producers and contractors on concrete construction;
4. Communicate the need, benefit and responsibilities under performance-based specifications to ready mixed concrete producers;
5. Establish relationships with researchers and codes and standards writing bodies to affect change;
6. Provide support for performance-based projects.

Goal 2: Credibility

Develop criteria that establish the credentials of the ready mixed concrete producer and contractors.

Strategies

1. Define the qualification requirements of ready mixed concrete industry;
2. Define the requirements of a quality management system for ready mixed concrete companies;
3. Establish a qualification criteria for persons that would sign off on performance-based concrete mixtures;

4. Support development of qualification criteria for contractors.

Goal 3: Codes and Standards

Affect change to establish performance-based alternatives in codes and specifications.

Strategies

1. Develop and implement alternatives to code requirements for concrete that are currently prescriptive or of a conflicting nature and accompanying specification clauses;
2. Facilitate the standardizing of innovative test methods for product evaluation and acceptance of performance-based concrete;
3. Formation of an ACI Committee for Performance of Concrete Materials and achieve broad participation to develop performance criteria in industry standards.

Goal 4: Technology

Promulgate the development and use of reliable and practical tests and standards to facilitate performance-based specifications.

Strategies

1. Utilize resources from the RMC Research and Education Foundation and other funding entities to support programs of the P2P Initiative;
2. Identify gaps in performance tests and facilitate the development of alternatives;
3. Support the development of simple and quick quality control procedures to enhance the predictability of concrete performance;
4. Support efforts that model concrete performance.

Goal 5: Sustainability

Develop initiatives that establish the linkage between sustainable development and performance specifications for concrete.

Strategies

1. Support sustainability initiatives of allied industry groups that are pertinent to performance of concrete;
2. Develop information documenting how performance specifications support sustainable development;
3. Support and participate on initiatives for rating the "green" aspects of concrete mixtures and ready mixed production facilities;
4. Develop simple and strong messages linking performance specifications to sustainability initiatives.

Goal 6: Education

Educate the concrete construction community on the benefits and use of the alternative of performance-based specifications.

Strategies

1. Develop model performance specification and evolve to format acceptable to A/Es;
2. Develop educational materials that describe differences between prescriptive and performance specifications, and advantages/disadvantages of each approach;
3. Support dissemination of information on P2P Web site and through NRMCA educational channels;
4. Publish articles to document the progress of the P2P Initiative;
5. Capture case studies to document benefits of performance specifications in terms of quality, cost and schedule. ■

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