

ACI Committee 329
Performance Criteria for Ready Mixed Concrete
Minutes – Washington, DC, Wednesday October 29, 2014

The following were in attendance:

Mark Chrzanowski, Chairman
Colin Lobo, Secretary
Peter Bohme
Joe Clendenen
Matthew D'Ambrosia
Josh Edwards
James Hicks
Scott Keim

Richard Meininger
Karthik Obla
Vasyl Shymonyan
David Tepke
Michelle Wilson
Fouad Yazbeck

ACI Staff:
Jerzy Zemajtis
Matt Senecal

1. The meeting was called to order at 9:30 am by Chairman Mark Chrzanowski. Attendees introduced themselves. Chairman indicated that his term was coming to an end and that TAC was in the process of selecting the next Chairman of the Committee.
2. The agenda was presented and approved.
3. The minutes of the March 2014 meeting in Reno were approved.
4. Document update – Chair reviewed editorial comments from staff and submitted document. This will complete the process to publish the document – ACI 329R.
5. Obla presented on an NRMCA review of specifications for existence of prescriptive provisions. Based on industry input, the existence of 5 prescriptive provisions in about 100 specifications was reviewed. These prescriptive provisions were not in ACI standards without a specific reason. Most common occurrences were limits on SCMs and w/cm when not applicable. It was suggested that these prescriptive provisions caused a significantly higher strength of concrete relative to the overdesign required in ACI 318 and 301. The presentation is attached to these minutes.
6. The Committee reviewed the outline to the guide to writing a performance-based specification. The ACI 506.5R document would be used as the format for the ACI 329 document. The suggestion was to include relatively short description of intent and rationale and to suggest specification language and notes the A/E in a two-column format. Lead volunteers and others willing to assist with sections were identified based on the attending members. The lead authors will solicit other members of the committee to assist with the chapters. The outline with volunteer names are attached to these minutes.
7. There was a suggestion for a future session. Also a possible webinar based on a canned presentation of the scope of ACI 329R. Chrzanowski will forward the previously developed presentation to Yazbeck for review and development of a canned presentation for a potential webinar offering. The webinar could be recorded and made available for professional development hours through ACI.
8. Next meeting – will be at the Spring Convention in Kansas City, MO.
9. There being no further business, the meeting was adjourned at 11:00

Respectfully submitted

Colin Lobo, Secretary

NRMCA P2P Survey 2014

329 Committee Meeting, ACI Convention
October 2014



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Phase 1 – Identify Most Onerous Prescriptions

RES committee members rated on

- Frequency of appearance
- Compliance does not really improve concrete performance and/or raises costs without an equivalent performance gain



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The Top 5 Prescriptions

Prescriptive Requirements (NRMCA proposed)	Avg. Rating
Invoking maximum w/cm when not applicable	1.6
Invoking a minimum content for cementitious materials	1.9
Restriction on quantity of supplementary cementitious material (SCM)	2.0
Restrictions on characteristics of aggregates - grading etc.	2.1
Restriction on type and characteristics of SCM	2.3
Restriction on changing mix proportions to accommodate material variations, ambient cond	2.6
Restriction on type and source of aggregates	2.8
Requirement to use potable water	2.8
Restricting the use of a test record for submittals	2.9
Restriction on cement alkali content	3.3
Prescriptive requirements toward sustainable mixtures - use of 50% fly ash, recycled aggregate	3.3
Restrictions on Type and source of cement	3.4
Restriction on use of recycled aggregates and mineral fillers	3.5
Restriction on type or brands of admixtures	3.8
Not allowing use of cement conforming to ASTM C1157 and ASTM C595	4.3

Phase 2 – Quantify State of Prescription in Industry

- RES members send project specs
 - 12 months
 - Application type
 - No residential
- NRMCA staff to assign ratings
 - Each of the 5 prescriptions gets "1"



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Phase 2 – State of Prescription

- 102 project specs form 14 members
 - Multiple specs from Walmart
 - Regional specs (FL, East coast, CA, OK,)
- Applications
 - 13% floors
 - 14% environmental structures
 - 23% educational / public buildings
 - 39% commercial
 - 18% public works
- Less than 5% use ACI 318 exposure classes



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Phase 2 – State of Prescription

Prescription	% of all specs including this requirement
Restriction on SCM dosage	85%
Max w/cm when not applicable	73%
Minimum cementitious content	46%
Restriction on SCM type, characteristics	27%
Restriction on aggregate grading	25%
Overall average	51%

% of these in ACI 318	0% (SCM limit for scaling, w/cm for exposure)
% of these in ACI 301	Same as ACI 318, 20% for floors (SCM dosage)



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NRMCA Producer Quality award

- 150 applicants over 5 years
- Award submittal – 2-3 mix submittals
- Specified strength = 3800 psi
- Standard deviation = 485 psi
- Target average = 4450 psi
- Actual average = 5200 psi (750 psi)



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Thank you!

Questions?



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ACI 329 - Guide to Writing a Performance Based Specification

Outline

- 1 Introduction and Scope Ben Tyman**
 - 1.1 General
 - 1.2 Scope
 - 1.3 Specification formats
 - 1.4 Assignment of Responsibility
- 2 Specification Section: General Colin Lobo**
 - 2.1 Specification Summary
 - 2.2 Related Documents
 - 2.2.1 Construction-related documents and drawings
 - 2.2.2 References
 - 2.2.3 Terminology and Definitions
 - 2.3 Submittals
 - 2.3.1 Materials Rusty Owings
 - 2.3.2 Concrete Mixtures
 - 2.3.3 Prequalification Testing
 - 2.3.4 Other – sustainability, etc
 - 2.4 Quality Assurance Keim
 - 2.4.1 Qualifications Contractor, Manufacturer and Personnel
 - 2.4.2 Quality Plan
 - 2.4.3 Qualifications and Responsibility of Owner’s Testing Agency
 - 2.4.4 Source Limitations
 - 2.4.5 Pre-construction Conference
- 3 Specification Section: Products Jim Hicks**
 - 3.1 Concrete Materials Bohme and Clendenen
 - 3.1.1 Cementitious Materials
 - 3.1.2 Water
 - 3.1.3 Admixtures
 - 3.1.4 Other Materials
 - 3.2 Concrete Mixtures Edwards and Clendenen
 - 3.2.1 Requirements for Mixtures member type Rusty Owings
 - 3.2.1.1 Information and identifying required performance
 - 3.2.2 Fresh Concrete Properties
 - 3.2.2.1 Pumping

- 3.2.2.2 Placing
- 3.2.2.3 Finishing
- 3.2.3 Hardened Concrete Properties
 - 3.2.3.1 Strength
 - 3.2.3.2 Durability
- 3.2.4 Other Performance Requirements
- 3.3 Concrete Production and Delivery
 - 3.3.1 Ready Mixed Concrete
 - 3.3.2 Site Mixed Concrete
 - 3.3.3 Other Methods
- 4 Specification Section: Execution Contractor ... Gibbons (Chrz will talk to Jim to see if he can help recruit if not write)... Tepke?**
 - 4.1 Concrete Placement
 - 4.1.1 Cold Weather
 - 4.1.2 Hot Weather
 - 4.1.3 Other Requirements
 - 4.2 Field Quality Control Edwards (apply ACI 329) Like the master spec
 - 4.2.1 Resources for Testing Agency
 - 4.2.2 Concrete Tests
 - 4.2.3 Criteria for Acceptance
- 5 Test Criteria for Performance Rusty Owings (Task Leader)**
 - 5.1 Defining Requirements Chrzanowski and Obla
 - 5.1.1 Strength
 - 5.1.2 Durability
 - 5.1.3 Other D Ambrosio
 - 5.2 Pre-qualification tests
 - 5.3 Jobsite Tests Coordinate with 4.2 may be be able to combine
 - 5.3.1 Establishing criteria for reliable assessment D Ambrosio (MN) Carino?
 - 5.4 Referee Tests
 - 5.4.1 Samples from Structure
 - 5.4.2 Non-Destructive Tests
 - 5.5 Measurement and Payment
 - 5.5.1 Incentives and Penalties s

6 References

OTHER COMMENTS:

If Chapter 5 is about Test Criteria, possibly 5.5 to Chapter 6. Measurement and payment issues may only be on a subset of all projects

Should Curing be included? Slightly different in a performance environment? If so, it would become 4.2.3