



American Concrete Institute®
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AGENDA

RESPONSIBILITY IN CONCRETE CONSTRUCTION COMMITTEE

**Westminster Room
Renaissance Grand and America's Center
St. Louis, MO
Sunday, November 2, 2008
2:00 p.m. – 5:00 p.m.**

MEMBERS

Jeffrey Coleman, Chair
Kenneth Bondy
Ronald Burg
Boyd Clark
Peter Emmons
Beverly Garnant
Geoffrey Hichborn, Sr
Mohammad Iqbal

William Klorman
Jim Kretz
Colin Lobo
Thomas Malerk
Christopher Mosley
Matthew Offenber
Ava Shypula
Eldon Tipping

Michael L. Tholen, Staff Liaison

1.0 APPROVAL OF MINUTES AND AGENDA

1.1 Approval of Minutes of 2008 Spring Meeting—Los Angeles, CA

The Responsibility in Concrete Construction Committee (RCCC) is asked to approve the minutes of the meeting in Los Angeles, CA, held on March 30, 2008.

1.2 Approval of Agenda

RCCC is asked to approve the St. Louis 2008 Agenda.

2.0 MEMBERSHIP

Chair Jeff Coleman will announce two new members of the RCC Committee (Bev Garnant and Matthew Offenber) and introduce any visitors at the meeting. Members are asked to ensure that the data on the roster (*Exhibit 2.0*) are correct.

3.0 ACTIVITIES OF THE COMMITTEE

3.1 Future Convention Session

The Committee-sponsored session, "Use and Misuse of ACI Documents," will be held on Wednesday morning from 9:00 AM to 12:00 PM in room C-223. Boyd Clark will moderate the session for RCCC. Presentations will include:

- "Poor Specifications I Have Seen," by Ward Malisch;
- "Use and Misuse of ACI Documents," by Kenneth Bondy;
- "Developing Complete and Unambiguous Specification," by Eldon Tipping;
- "How to Abuse and Misuse ACI 301," by Calvin McCall;
- "The Adverse Effect High Cementitious Contents have on High-Strength Concrete," by Casimir Bognacki;
- "Case Studies in the Misuse of Specifications," by Jeffrey Coleman; and
- "Durability Beyond ACI 201," by Michael Thomas.

The session will conclude with a panel discussion.

Action: Boyd Clark will update the Committee on the session.

3.2 New Responsibility Document

In Washington, DC, RCCC members decided to draft a new responsibility document, with task groups assigned to each of the different entities involved in a construction project: owner, design professional, general contractor, D-B contractor, subcontractor, specialty subcontractor, material supplier, testing/inspection, and forensic consultants. It was noted that each task group may publish opinion papers as they deal with issues during document development. The following motion was unanimously approved: "RCCC develop a new document, 'Responsibility in Concrete Design and Construction,' and to do so, establish nine task groups. Each task group is associated with an entity involved in construction. Each task group will have a chair whose responsibility it will be to draft an outline of each group's goals 30 days before the San Francisco convention, and to report on these findings at the convention."

In Los Angeles, Jon Mullarky submitted a draft of the document that combines all current sections and outlines. He suggested that the document should focus more specifically on concrete construction, such as who is responsible for providing the information needed to proportion mixtures. In many places, it currently reads as if it is intended for general construction. Discussion was also held regarding where geotechnical engineers would fit in the current task group divisions because they are typically hired by the owner and have little contractual relation to the other parties in

the design team. It was decided that there needs to be a new task group and section dealing with the responsibilities of geotechnical engineers. Geoffrey Hichborn agreed to chair the task group and asked others interested in developing this section to contact him. The members for each task group were reviewed to fill gaps left by outgoing RCCC members and place new members in the appropriate task groups. The current task groups are as follows:

Owner

?-Chair

Tom Malerk

Design Professional

Jeff Coleman-Chair

Ken Bondy

Eldon Tipping

Chris Mosley

General Contractor

Jim Kretz -Chair

Bill Klorman

D-B Contractor

Bill Klorman-Chair

Jim Kretz

Subcontractor

Jim Kretz-Chair

Ken Bondy

Bill Klorman

Bev Garnant

Geotechnical Engineer

Geoff Hichborn-Chair

Specialty Subcontractor

Ken Bondy-Chair

Bill Klorman

Chris Mosley

Material Supplier

Colin Lobo-Chair

Ken Bondy

Geoff Hichborn

Testing/Inspection

Ava Shypula-Chair

Geoff Hichborn

Boyd Clark

Eldon Tipping

Forensic Consultants

Boyd Clark-Chair

Ken Bondy

Bill Klorman

Geoff Hichborn

Eldon Tipping

The latest version of the document is included in *Exhibit 3.2*.

Action: The task groups are asked to update the Committee on the progress made on their sections.

3.3 Committee Assistance with TAC Review Process

For the Fall TAC review cycles, only one document contained mandatory language. ACI 423.X, "Specification for Testing of Cementitious Grouts for Post-Tensioning Tendons," was reviewed by Colin Lobo. He did not find any responsibility issues that required comment.

3.4 Performance Specification and Responsibility

In Los Angeles, Ward Malisch and Bruce Suprenant asked the Committee to consider new responsibility concerns that may arise with increased use of performance specifications. Their concerns are outlined in the letter in *Exhibit 3.4*.

Brad Inman noted that the P2P Initiative will not remove many of the potential conflicts between the contractor and the ready mixed concrete supplier and that the Committee will have to consider instances like the ones brought up in the letter carefully when putting together the new responsibility document. Eldon Tipping noted that Committee 116 is trying to develop realistic, achievable tolerances that he hopes will help alleviate some responsibility issues such as the one regarding concrete on metal deck mentioned in the letter.

Action: Malisch and Suprenant will attend the meeting to discuss their concerns.

4.0 NEW BUSINESS

4.1 Canadian Standard CSA A23.1

ACI Board of Direction member Claude Bedard pointed out that CSA A23.1 covers responsibility between the owner, contractor, and concrete producer in Table 5.

5.0 NEXT MEETING

The RCCC meeting at the San Antonio convention will be held on Sunday, March 15, 2009, from 2:00 to 5:00 p.m.

6.0 ADJOURNMENT

Attachments:

- Exhibit 2.0: RCCC roster
- Exhibit 3.2: New document draft
- Exhibit 3.4: Letter from Ward Malisch and Bruce Suprenant

Exhibit 2.0 - 1

Membership Roster

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DRAFT March, 2008

**Responsibility in Concrete Construction
A Report by the ACI Responsibility in Concrete
Construction Committee**

1. Introduction

2. Responsibilities of the Owner.

2.1 Ultimate Responsibility for the Entire Project.

As the final decision making authority, the Owner has ultimate responsibility for the entire construction project. Directly or indirectly all parties in the process report to the owner.

2.2 Define the Project

The Owner is responsible for project definition, which includes establishing the scope and objectives of the project, the overall budget and project schedule. Further, the Owner is responsible for clearly communicating project requirements to the Design Professional developing the plans and specifications for the project. Should the project requirements be changed, the Owner must be prepared to accept the costs and/or schedule consequences of the changes.

2.3 Provide Funding for the Project

Before entering into any stage of the project, the Owner must ensure that required funding, including a reasonable contingency reserve, is available.

2.4 Provide needed real estate, rights of way, permits, and insurance.

The Owner will provide the building site, all rights of way and easements for site access and utilities, all required construction related permits and insurance, unless otherwise delegated in the contract documents.

2.5 Beyond legally established codes and regulations, the Owner establishes quality and performance standards for the project.

The scope and objectives of the project, set forth by the Owner in contract documents, shall establish the quality level expected of the construction and any performance standards required by the Owner.

2.6 Establishes system for overall project management.

It is the Owner's responsibility to establish the overall project management structure and clearly enunciate management and decision-making authority.

2.7 Selects key designers, managers, and contractors.

The Owner should establish and follow a fair and ethical procedure for selection of key members of the design and construction team.

2.8 Establishes quality assurance program

2.9 Provides overall site safety and security.

2.10 Makes agreed upon payments as project goals are met.

2.11 Accepts the completed project.

3. Responsibilities of the Design Professional

3.1 Perform all professional services including designing the work in accordance with the standard of care.

Design Professionals generally have the responsibility to perform their services, including designing the work, in accordance with the "Standard of Care." The Standard of Care is generally determined on a case-by-case basis; however, it can be defined in the contract between the parties. If not defined in the contract between parties, it is generally defined as the "the exercise of the skill and judgment which can be reasonably expected from similar situated professionals" and "to exercise such care, skill, and diligence as men in that profession ordinarily exercised under like circumstances." Thus, the Standard of Care creates a responsibility on the part of the Design Professional to perform their services in the same manner that a prudent designer would perform their services in a similar geographic area and in a similar timeframe.

3.2 Code Compliance with Applicable Codes.

Design Professionals have a responsibility to perform their services, including design of the project in accordance with applicable codes. However, there may be instances where the building code represents a minimum design standard. In those cases, the applicable Standard of Care may require that the Design Professional exceed minimum code requirements.

3.3 Coordinate with Other Design Professionals.

A lead Design Professional has a responsibility to coordinate its work with other subconsultant Design Professional. However, if the Owner has retained other Design Professionals under direct contract with the Owner, then the Owner has a responsibility to designate which of the multiple

prime Design Professional has the responsibility to coordinate with the work of the various multiple prime Design Professionals.

3.4 Prepare Analytical and Design Justification (calculations) used for the preparation of Design Documents.

The Design Professional has a responsibility to prepare design calculations as appropriate and consistent with the Standard of Care. The Design Professional does not have a responsibility to issue or publish those calculations unless required by the contract documents, applicable codes, regulations or laws.

3.5 Provide Design documents for Construction, which should, at a minimum, include the following items: drawings, specifications.

The design documents are not expected to be perfect; however, the design documents should be adequate to describe the intended final outcome of the project and the final performance criteria of the components of the project and the over completed project.

3.6 Issue Material Specifications and Installation Specifications Considering Local Practice.

The Design Professional has a responsibility to specify the types of materials required for the project. The Design Professional should specify installation procedures that are necessary for the proper completion of the project. However, the Design Professional is not responsible for specifying the Contractor's means, methods, techniques, sequences, or procedures, as those are the responsibility of the Contractor. There are however, instances where Design Professional must specify means, methods, techniques, sequence and procedures so that the Contractor understands not only the materials to be provided for the project, but how these materials are to be installed so as to meet the Owner's final criteria.

3.7 Provide field Observation if required in the Owner's Contract and/or Applicable Codes, Regulations, or Local Laws.

The Owner is responsible for determining the amount of field observation that the Design Professional will provide, and the Owner is responsible for paying an adequate fee to allow such field observations.

3.8 Perform all Inspections, Observations, and Reviews of Construction On-Site if Required by the Contract or Applicable Codes, Regulations, or Laws.

3.9 Perform Shop Drawing Review in Accordance with the Terms and Conditions of the Contract Between the Design Professional and the Owner.

3.10 Understand and convey the Owner's requirements in the Plans and Specifications.

The Design Professional should endeavor to fully understand the Owner’s requirements; however, the Owner has a responsibility to communicate those requirements and also has the responsibility to accept the cost and/or schedule consequences of changes in those requirements.

3.11 Review Submittals for General Contract Compliance if Required by the Contract Between the Owner and the Design Professional.

3.12 Either Perform or Confirm Who Will Perform Special Inspections Required by Building Codes, if Applicable.

4. Responsibilities of General Contractor

Definition: A general contractor is a contractor whose scope of work includes the construction of a portion of the work. This work is described in the “general contract documents”.

4.1 Construct the building in accordance with the contract documents and with the appropriate standard of care for general contractors in the geographical area of the work.

4.2 Contractors have no direct responsibility to engineering design requirements found in building codes.

4.3 Contractors conform to code design requirements by building in accordance with the contract documents.

4.4 Contractors have a right to assume that contract documents contain all applicable code and other requirements.

4.5 Call attention to any obvious errors or discrepancies in the contract documents.

4.6 Makes agreed upon payments to subcontractors and material suppliers as project goals are met.

5. Responsibilities of the Design-Build Contractor

6. Responsibilities of the Subcontractor

7. Responsibilities of Specialty Subcontractors

Definition: A specialty subcontractor is one whose scope of work includes the construction *and* the design of a portion of the work. The specialty subcontractor retains a licensed design professional to execute the delegated design work. Examples would include the design and construction of precast concrete elements, or the design of and construction of all or part of cast-in-place post-tensioned floor systems.

Exhibit 3.2 – 5

- Retain the services of a design professional (specialty engineer) with demonstrated expertise and /or experience in the type of work to be designed. Responsibilities of the specialty engineer include:
 - Design the work in accordance with the standard of care for the design of similar works in the same geographic area.
 - Prepare plans and specifications for the work that incorporate all applicable building code requirements, laws, and ordinances.
 - Perform all contractually required inspections, observations, and reviews of placing and/or shop drawings.
- Review the design for obvious errors or differences from generally accepted standard practices.
- Construct the work in accordance with the plans and specifications prepared by the specialty engineer.
- Construct the work in accordance with the standard of care for the work involved and in accordance with standard practices of similar subcontractors in the same geographic area.

8. Responsibilities of the Material Supplier.

9. Responsibilities of the Testing/Inspection Agency

10. Responsibilities of the Forensic Consultant

Exhibit 3.4 – 1

RCC Committee Members,

As performance specifications become more common, we believe that responsibility issues will become more complex. Although this letter discusses two specific examples, the point is that changing to performance specifications may make it necessary to view responsibility issues in a new light.

The P2P movement (Prescription to Performance specifications) will bring an even closer focus on responsibility in concrete construction. Concrete producers explain that they need to know what final criteria must be met so they can best meet those criteria using their expertise in choosing and using the component materials. To paraphrase Colin Lobo: “Don’t give us the cake recipe. Just tell us how what kind of cake you want.”

An analogous movement might even be forthcoming in the area of construction tolerances. Don’t tell the builders what tolerances we need for the different pieces. Just tell them how you want the pieces to function (no leakage at windows, for instance.) This also brings a closer focus on responsibility—in this case a responsibility not just for one player—the concrete producer—but shared by several members of the construction team.

Let us give you two examples of responsibility that we believe need to be better established. First let’s talk about performance concrete, specifically self-consolidating concrete. ACI 237R-07, “Self-Consolidating Concrete,” describes self-consolidating concrete as “highly flowable, nonsegregating concrete that can spread into place, fill the formwork, and encapsulate the reinforcement **without any mechanical consolidation [we added this emphasis.]**”

Let’s assume SCC is used for the walls in a water-retaining structure. No vibration is used by the contractor. And the results are as follows, in one lift only:



Who is responsible for the cost of repair or replacement? We can imagine this situation resulting in a finger-pointing exercise. The concrete producer may be accused of not supplying a sufficiently self-consolidating concrete. The concrete contractor may be accused of incorrectly installing the reinforcing steel, embeds, or both such that a congestion created dams through

which even self-consolidating concrete couldn't flow. The design professional may be accused of creating too many lap splices in one area, and thus being responsible for congestion and the dam. The testing laboratory may be accused of not running the required on-site tests to ensure that the SCC was capable of being placed without consolidation. How will these responsibility issues be sorted out?

Now let's talk about tolerances. Contractors are asked to place composite concrete floors on metal decking supported by a structural steel frame. This is usually unshored construction. ACI 302.1R-04 contains the following statements:

Section 3.3.2

The levelness of suspended slabs depends on the accuracy of formwork and strikeoff but is further influenced (especially in the case of slabs on metal decking) by the behavior of the structural frame during and after completion of construction. **Each type of structural frame behaves somewhat differently; it is important for the contractor to recognize these differences and plan accordingly [Bold emphasis added].**

The presence of camber in some floor members and the ACI 117 limitation on tolerances in slab thickness **dictate that concrete be placed at a uniform thickness over the supporting steel . When placing slabs on metal decking, the contractor is cautioned that deflections of the structural steel members can vary from those anticipated by the designer. [Bold emphasis added]**

Section 3.3.5.1

Unshored composite construction is the more common method used by designers because it is less expensive than shored construction. In unshored construction, the structural steel beams are sometimes cambered slightly during the fabrication process. This camber is intended to offset the anticipated deflection of that member under the weight of concrete. Ideally, after concrete has been placed and the system has deflected, the resulting floor surface will be level (Tipping 2002). [Bold emphasis added]

Levelness and elevation of the finished floor are affected both by formwork (contractor responsibility) and by dead-load deflection (design professional responsibility). But the statements in this document certainly seem to put most of the responsibility on the contractor to recognize differences in behavior of structural frames and to plan accordingly—even though thickness tolerances require an essentially uniform thickness. It is of little consolation that for cambered steel beams, “Ideally, after concrete has been placed and the system has deflected, the resulting floor surface will be level,” because the ideal is seldom if ever achieved. So who is responsible when the partitions don't fit?

The RCCC responsibility document is silent on these points. But we don't think it should be. And we realize that these are very sticky subjects.

Exhibit 3.4 – 3

Unfortunately, we will be unable to attend the RCC Committee meeting in Los Angeles, but we will plan on attending the meeting in St. Louis. It is our hope that a discussion can be started in Los Angeles regarding these important issues, and continued in St. Louis.

Sincerely,

Ward Malisch and Bruce Suprenant