Meeting Agenda
ACI 332 – Full Committee Meeting
Residential Concrete
Tuesday, November 4, 2008
Room: Renaissance-Landmark
2:00 – 5:00 pm

Note: Sub-Committee Meeting Schedule reflects combined sub-committee activity:

332 B&C	*Tue*	*8a-11a*	*R-LANDMARK 1*
332 D & E	*Tue*	*8a-11a*	*R-MAJESTIC BALLROOM B*
332-F	*Tue*	*11a-2p*	*R-MAJESTIC BALLROOM B*

I. Welcome & Introductions

II. Review of minutes from previous meeting (Los Angeles)

III. Committee Membership

IV. Committee Document Update

- A. ICC Update – Sauter
- B. 332/332M - Baty

V. ACI 332 Committee Reports

- A. 332-A Scope & Definitions & References – Baty
- B. 332-B Materials & Concrete Requirements – Balik
- C. 332-C Production & Placement – Lemay
  - 1. Calcium Chloride Errata
- D. 332-D Footings & Foundation Walls – Humphreys
- E. 332-E Above Grade Walls – Sauter
- F. 332-F Slabs – Rogers

VI. Related Interest Reports

- A. CFA Contractor Certification – Sauter

VII. Old Business

- A. ACI 332 Technical Session *(San Antonio)* – Huffman

VIII. New Business

IX. Future Task Group and Committee Meetings

X. Adjournment

ACI 332 Full Committee Meeting
Residential Concrete
Official Meeting Minutes (draft)

Tuesday, April 1, 2008
Room: Sherman Oaks
2 – 5 pm

Members in Attendance
Raj Jalla
Ed Sauter
Jim Rogers
Joe Balik
Donn Thompson
Kevin Wolf
Robert Sculthorpe
Barry Deschenaux
Jim Baty
Kirby Justesen
Warren McPherson
Scott Humphreys
Said Iravani
Buck Bartley
Lionel Lemay
Ashok Kakade
Tarek Khan
Christopher Tull
Ken Bondy (TAC liaison)
Miroslav Vejvoda (staff liaison)

Guests in Attendance
Dale Phillips, Cypress Engineering
Steve Wittstock, Old Castle Materials
Darryl Dixon, Thermomass
Ken Luttrell, CYS Engineering
Joe Warnes, CPM Associates
Carrie Wyrick, PCI
PW Brown, Penn State Univ
Jim Jenson, LaFarge

I. Welcome & Introductions

Baty called the meeting to order at 2:08pm, serving as chair for this meeting due to the absence of Huffman. The roster was passed for review for accuracy, introductions were made throughout the room, and the agenda/focus for today's meeting being that of the completion of the 2008 edition of the 332 Standard were discussed. Baty also asked Sauter to serve as secretary for this meeting.

II. Review of minutes from previous meeting (Puerto Rico)

Humphries offered a motion for approval with no corrections with a second by Justesen. Unanimous consent to the approval with no abstentions.

III. Committee Membership

Baty discussed the current membership status and the need to continue promoting this Committee for future development. As a code committee, expertise needs to brought into the committee for a broader spectrum of issues to ensure growth and completion of a well-rounded document. Revisions to the membership roster were made by Claude Bergeron, Raj Jalla, and Robert Sculthorpe with Geoffrey Hichborn submitting application for membership. Ashok Kakade and Christopher Tull requested updates on their membership status to voting. These issues will be communicated to ACI staff and the chair for processing as required.

IV. Official Committee Action

A. IRC Hearing Update – Sauter

CFA, ACI and NRMCA sponsored a code change referencing Chapter 3 (Materials) and Chapter 6 (Footings) in the 2009 Edition of the IRC. Sauter attended the IRC hearings and recommended disapproval at this time since the standard has not been published. If the document is completed and published in time, the proposal will be resubmitted during the

IRC public comment phase for action by the full assembly of the IRC in the fall of 2008 (Minneapolis).

B. Public Review Responses for 332-07~~7~~8

Baty reported that there were 136 Comments in the Public Review cycle – ACI 332-08. Cycle has lost 1 year. It is the primary purpose of this meeting to finalize any changes to the document and respond to all public review comments here and then to return to TAC immediately following this meeting in order to make ICC deadlines.

C. All Public Review comments were reviewed by the respective task groups to produce action recommended to the full committee. These actions consisted of finding comments as persuasive and either editorial or substantive in nature; non-persuasive or slated for new business. Following are the actions taken during the committee meeting to resolve the public review comments:

1. At time of entering into the document action, 17 voting members were present constituting more than the 40% (13) required for official action during a committee meeting. These were Bergeron, McPherson, Khan, Sculthorpe, Descheneaux, Humphries, Sauter, Wolf, Balik, Rogers, Baty, Irvani, Justesen, Jalla, Bartley, Lemay, Thompson.

Note: Khan left after first vote and Justesen left at approximately 4:30. Ken Bondy visited but was not present for any votes. Alternatingly, members stepped out as needed with the balance never falling below the 13 required.

2. Public Review Comments #1, 6, 7, 11, 30, 33, 34, 35, 37, 38, 40, 42, 46, 51, 64, 65, 68, 73, 75, 77, 79, 90, 95, 101, 102, 104, 115, 119 (28 total)

a) Descheneaux asked that the committee response to comment #7. be shortened since there was no definitive resolution proposed by the commenter and not offer such a definitive stance on the issue.

Motion made by Bartley and seconded by Khan to remand the above public comments to new business. The motion passed by a vote of: 15 yes, 0 no, 2 abstain (Wolf, Descheneaux)

3. Public Review Comments #2, 3, 4, 5, 8, 9, 15, 18, 20, 39, 54, 55, 56, 60, 62, 67, 69, 70, 72, 78, 82, 83, 85, 88, 89, 92, 93, 94, 96, 97, 98, 99, 100, 103, 105, 106, 107, 108, 109, 110, 112, 113, 114, 116, 117, 118, 125, 136 (47)

Motion: Made by Balik and seconded by Sculthorpe to find the above public comments non-persuasive. The motion passed by a vote of: 14 yes, 0 no, 2 abstain (Descheneaux, Sculthorpe).

4. Public Review Comments #10, 12, 13, 14, 16, 17, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 36, 41, 43, 44, 45, 47, 48, 49, 50, 53, 59, 61, 66, 71, 74, 80, 81, 91, 111, 120, 121, 122, 123, 124, 126, 127, 128, 129, 130, 131, 132, 133 (50)

Motion made by Humphries and seconded by Bartley to find the above public comments editorial. The motion passed by a vote of: 16 yes, 0 no, 0 abstain.

5. The remaining Public Review Comments were held from the bulk motions due to their potential impact to the document or lack of final direction from sub-committees.

Motion made by Rogers and seconded by Justesen to remand comment #20 to non-persuasive. The motion passed by a vote of: 16 yes, 0 no, 0 abstain.

Motion made by Wolf and seconded by Irvani to find public comment #52 substantive and approve the corrective wording. The motion passed by a vote of: 13 yes, 0 no, 3

abstain (Descheneaux, Bergeron, Thompson). **Note:** After this action, this was revisited towards the end of the session as discussion ensued for #57 and #58. See below for final action.

Motion made by McPherson and seconded by Wolf to find public comment #63 substantive and approve the corrective wording. The motion passed by a vote of: 12 yes, 1 no, 1 abstain (Balik).

Motion made by Sauter and seconded by Bartley to find public comment #76 substantive and approve the corrective wording. The motion passed by a vote of: 13 yes, 0 no, 1 abstain (Bergeron).

Motion made by Humphries and seconded by Sculthorpe to find public comment #78 non-persuasive. The motion passed by a vote of: 14 yes, 0 no, 0 abstain.

Motion made by Sauter and seconded by Balik to remand public comment #84 to new business. The motion passed by a vote of: 13 yes, 0 no, 0 abstain.

Motion made by Sauter and seconded by Rogers to find public comment #86 substantive and approve the corrective wording. The motion passed 13 yes, 0 no, 0 abstain.

Motion made by Sauter and seconded by Humphries to find public comment #87 substantive and approve the corrective wording. The motion passed 13 yes, 0 no, 0 abstain.

The committee revisited public comment #52 following consultation with the commenter (Colin Lobo).

A motion was made by Rogers and seconded by Bartley to rescind action on comment #52 and to remand comments #52, #57, and # 58 to new business. The motion passed 13 yes, 0 no, 1 abstain.

Following the completion of the work on the 2008 Standard, Baty thanked the Committee for their diligent work and thanked those remaining guests for their patience. Great focus was provided for this meeting and it will benefit the document greatly. Baty added that staff would be consulted on the turnaround for the next edition with the hope that we could produce a 2010 edition that would put us back on the original cycle and a year and a half ahead of the IRC adoption schedule to prevent this urgency in the future.

V. ACI 332 Committee Reports

A. 332-A Scope & Definitions & References – Baty
No report as this sub-committee did not meet in LA. Work here is focused on maintaining the document general sections as needed

B. 332-B Materials & Concrete Requirements – Balik
Balik reported that this committee spent the duration of their meeting time focused on the Public Review comments and actually ran out of time. They request a longer meeting time at future conventions.

C. 332-C Production & Placement – Lemay
Lemay was not present for the sub-committee meeting until the end. Balik and Baty continued the work of 332-B into the Public Comments for 332-C.

D. 332-D Footings & Foundation Walls – Humphreys

Humphreys reports that the focus of the committee was on the Public Review comments and then beginning to consider those recommended for New Business. The committee focused on the footing width section of the code and whether they were conservative or aggressive. These will be looked at in greater detail for the next edition. This committee also ran out of time and would like a longer session in the future.

E. 332-E Above Grade Walls – Sauter

1. Members were asked to review the current edition of the ACI 332 Guide document for errors, omissions, clarifications and items to include in the next edition.

2. This task group reiterated that its long-term goal is the ACI 332 Committee and the ACI 332 Standard become the only code for residential 1 & 2 family homes. This will ultimately include structural slabs as well as walls. Structural slabs were briefly discussed. Options include a task group within this task group, a group within the Slabs task group, or a completely different task group.

3. The Task Group affirmed the need for an above grade chapter within the Standard. Incorporation of the PCA Standard presents some problems since it was designed as a broad, empirical document that covered connections and interactions with non-concrete components. While the PCA standard is designed using ACI 318 the document also takes some exceptions, in particular with regard to minimum steel requirements. This, and the fact that non-concrete elements are addressed, is inconsistent with ACI's position to cover concrete components only. The first step would be a chapter defining the concrete components and forces using the PCA document as a reference standard. One option would be to define the loads and reactions that non-concrete components must be designed to meet.

4. The Task Group feels that a design chapter is needed for the ACI 332 Standard to eliminate the need to reference ACI 318. The chapter would deal with above and below grade walls, slabs, and retaining walls within the limitations established by the committee. It was agreed that this is a long-term project but that the efforts put forth earlier in the design chapter could serve as a starting point. The Alliance for Concrete Codes and Standards (ACCS) was discussed as a possible entity to develop the design chapter. It could then be turned over to the ACI 332 Committee for action under their consensus process. Sauter will ask that the design concept be placed on the next ACCS agenda.

5. The Task Group feels that additional time is needed for future meetings and requested that the Task Group chair ask for a 3-hour session at the next convention.

F. 332-F Slabs – Rogers

Rogers provided a brief report that in addition to looking at some of the review comments, the committee talked considerably about the issue of cracking in slabs. Hichborn was given the floor to talk about the truths and myths behind cracking causes and severity. It is this sub-committee's opinion that 332 should produce a new guide titled something like "Guide to the Significance of Cracking in Residential Concrete". This would encompass not only slabs but all concrete elements within the realm of 332. The full committee felt this would be a great benefit to the industry and urged its development.

VI. Old Business

A. Los Angeles—Spring 2008—ACI 332 Technical Session – Huffman

Baty provided a discussion of the session that took place yesterday. In general, the session had some technical problems related to the computer system that could not be overcome in

most cases. This terminated presentations earlier than intended. There were some coordination issues between earlier and final schedules and some presenters were not ready at the time they were called. However, we were able to work through as many of these as possible and the overall feeling was likely one of success.

The sessions were pretty well attended for the most part although they started slow and built through mine and into the second one. The interruptions or pauses created some ebb and flow for the attendance but I doubt any of the speakers were overly disappointed.

Finally, the consensus by committee members that were there is that some sessions had to much of a marketing focus rather than a technical focus. All were good presentations but perhaps not completely what we should deliver as a code committee.

VII. New Business

A. Future Technical Session Interests – St. Louis application

Baty stated that Huffman had placed a preliminary proposal for a 332 session in St. Louis to cover those presentations that were not fit into the LA matrix. We may want to revisit this instead for San Antonio but staff would be consulted. **Note:** Updated following the meeting, the application for St. Louis was likely to be approved but as a half day. This session is underway and perhaps a regular half-day approach can be taken to benefit each market we are in.

B. CFA Contractor Company Certification – Sauter

Sauter did not provide an update due to the late time of the meeting.

VIII. Future Task Group and Committee Meetings

Baty stated that he would seek a revised schedule for our Tuesday at Convention. In order to lengthen the sub-committee times, however, we may need to seek a full committee meeting on Wednesday. The committee felt this was not possible due to other conflicts. Therefore the proposal was drafted to combine Sub-Committee B & C into a half-day session, Sub-Committee D&E into a half-day session and provide a 3-hour session min. for Sub-Committee F. This would permit simultaneous meetings with little, if any, crossover in membership and then maintain the Full Committee meeting in the afternoon on Tuesday. The next Convention is in St. Louis, MO this fall.

IX. Adjournment

Baty received a motion for adjournment, a second and unanimous approval at 5:15pm.

Current wording in ACI 332-08

4.4—Calcium chloride

4.4.1 Where structural plain concrete is dry or protected from moisture in service, calcium chloride added to the mixture shall not exceed 2.0% by weight of cementitious materials. For structural plain concrete subject to other service conditions, and for all reinforced concrete, calcium chloride added to the mixture shall not exceed 0.30% by weight of cementitious materials.

R4.4.1 Additional information on the effects of chlorides on the corrosion of reinforcing steel is given in ACI 201.2R and 222R. Gaynor (1999) gives guidance on calculating the percentage of calcium chloride content.

4.4.2 Calcium chloride as an admixture, or admixtures containing intentionally added chloride ions, shall not be used in concrete containing aluminum or dissimilar metals.

Discussion

ACI 318 places limits on chloride ion content by weight of cement. The limits for concrete with structural reinforcement is 1.0% for members that will be dry in service; 0.3% for members exposed to moisture and 0.15% for members that are exposed to moisture and an external source of chlorides. The limit for prestressed concrete is 0.06% by weight of cement. There are no limits on the use of calcium chloride for plain structural concrete which may contain reinforcing steel that does not function as structural reinforcement and generally at less than 0.2%.

The molecular ratio of $CaCl_2$ (used in 332) to Cl^- (used in 318) is approximately 2:1. Limits in 332 expressed on the basis of $CaCl_2$ would be approximately 2 times the equivalent values in 318 expressed on the basis of Cl^-. Another difference is that 318 expresses limits as a percentage of the weight of cement while 332 expresses it on the basis of cementitious materials.

ACI 332 is more restrictive than ACI 318 when invoking limits for structural plain concrete and establishes limits equivalent to 0.15% Cl^- on structural plain concrete that is not dry in service and for all reinforced concrete regardless of service condition. Further it is less restrictive for prestressed concrete (generally post tensioned construction). These restrictive requirements can increase the cost of residential construction of slabs containing non structural reinforcement like driveways, basement walls, garage slabs, patios, etc. and is overly conservative. The use of calcium chloride for these applications in cold weather construction is common and has not been a concern for life safety or corrosion related failures of these types of concrete members. The current provisions will force the use of less effective and more expensive non-chloride accelerators that is not warranted for most residential construction.

Proposed revision

4.4—Calcium chloride

4.4.1 Where structural ~~plain~~ reinforced concrete is dry or protected from moisture in service or for structural plain concrete in all service conditions, calcium chloride added to the mixture shall not exceed 2.0% by weight of cement~~itious materials~~. For structural ~~plain~~ reinforced concrete subject to other service conditions~~, and for all reinforced concrete,~~ calcium chloride added to the mixture shall not exceed ~~0.30~~0.60% by weight of cement~~itious materials~~.

R4.4.1 Additional information on the effects of chlorides on the corrosion of reinforcing steel is given in ACI 201.2R and 222R. Gaynor (1999) gives guidance on calculating the percentage of calcium chloride content.

4.4.2 Calcium chloride as an admixture, or admixtures containing intentionally added chloride ions, shall not be used in concrete containing aluminum or dissimilar metals or for post tensioned concrete members.

Note that this represents one condition that is less restrictive than ACI 318 – for structural reinforced concrete that is subject to an external source of chlorides (where the limit would be 0.3% calcium chloride). This is a generally rare service condition for residential concrete structures.