

**ACI 318 Sub A – General Concrete and Construction**  
[ACI 318 Chapters 1, 2, 3 (excluding 3.5), 4, 5, 6, and 22  
Reorganized Chapters 5, 22, and 23]

Dallas Meeting  
Tuesday, 20 March 2011, 1:30 PM to 6:00 PM, Meeting Room Moreno B

**NOTE: This meeting will be shortened to allow members to attend the TAC Reunion scheduled for  
5:00PM**

**DRAFT AGENDA**

1. Call to order at 1:00 pm.
2. Introductions and Membership changes.  
Brian Gerber of ICC-ES has joined Sub A
3. Approval of Agenda.
4. Approval of Minutes: Cincinnati Meeting, 18 October 2011
5. Old Business: Please see the following Table for the agenda for the bulk of today's meeting.

Item	Description	Responsible	Time Allocated
5.1	General update from Steering Committee meeting	Terry	10 minutes
5.2	Resolution of issues from 318 LB of CA 026 Ballot results to be sent out before meeting	Terry	30 minutes
5.3a	Chapter 5, Resolution of negatives and significant comments from Sub A ballot on Commentary Ballot results enclosed with this agenda	Tony	40 minutes
5.3b	Chapter 5, Recommendations for top 3 new business items	Tony	Included in above
5.4a	Chapter 22, Resolution of negatives and significant comments from Sub A ballot on Commentary Ballot results to be sent out before meeting	Nick	40 minutes
5.4b	Chapter 22, Recommendations for top 3 new business items	Nick	Included in above
5.5	Chapter 23, Comments from presentation at Steering Committee meeting	Terry	10 minutes
5.6	Chapter 23, Resolution of negatives and significant comments from Sub A ballot on Commentary Ballot results to be sent out before meeting	Colin	40 minutes
5.7	CA 104, Resolution of Negatives from last ballot Recommendations from CA 104 Task Group enclosed with this agenda	Doug	15 minutes
5.8	Formation of Task Group to review ASTM C 1600 cements	Terry	10 minutes

5.9. Summary of all CA items. An updated list of all CA items was sent out after the Cincinnati meeting. This list showed 17 active items. Many of these active items have been referred to the Chapter 5 and Chapter 22 Task Groups to be included in the list of potential new business.

An updated list will be sent out after the Dallas meeting. The list will be update to reflect the actions taken on the new business items for Chapters 5 and 22.

5.10. Code reorganization.

5.10.1 Task Groups for Code Reorganization. Following are the current Task Groups. Note changes below to reflect that the work on the original Chapter 23 has been completed.

Chapter 5, Material Properties and Durability. **Tony, CH**, Fred, Doug, Jason  
Chapter 22, Concrete Materials and Quality Assurance, **Nick, CH**, Ken B., **Brian**  
Chapter 23, Construction Documents. **Colin, CH**, Steve, Ken H., Harry, Florian, Dean

5.10.2 Current Status: See the actions in the Table on page 2.

The following items will not be discussed during the Dallas meeting.

5.11. Use of 4 x 8 inch cylinders. Rachel Detwiler sent Sub A a copy of a paper that she has prepared. Mike Bartlett has also provided comments on this paper. Colin Lobo also provided additional information on this topic. The committee agreed that we would like to see data from additional labs before making any changes to the requirement for testing three 4 x 8 in. cylinders. Harry Gleich reported that the precast industry has converted to testing only two cylinders. Colin Lobo will forward additional test data. The committee agreed to reopen this item. Steve Kosmatka and Colin Lobo were appointed to summarize current data and to prepare a new ballot item for consideration. This item is assigned CA 105. **Steve and Colin will update references in CA 105 and send for a Sub A ballot. Status?**

5.12. Performance specifications and implications for 318. Topic remains open for possible action during this code cycle.

5.13. Adding alkali-silica reactivity (ASR) to the Code. Of all of the major durability issues with concrete, only ASR is not addressed in the Code. After discussion, a Task Group of Folliard, Hooton, and Fiorato was formed to review this issue and make a recommendation to the committee during the meeting in New Orleans. In Chicago, Tony reported that ASTM C09 is preparing a specification for dealing with ASR. Sub A agreed to put any action on hold until that document is completed. **It was agreed that it is still premature for Sub A to take any action here. This item will remain on the agenda until action is taken.**

5.14. Determining Lambda. Carino had the following comment on Sub A Ballot A02-09:

I have some questions about the splitting tensile strength. First,  $f_{ct}$  is defined as the average splitting tensile strength, so this is not a function of  $f'_c$ , but a function of the average compressive strength of the concrete. So it is not correct to say that  $f_{ct}$  is  $6.7 \sqrt{f'_c}$ . Second, I'd like an explanation of how an engineer would determine lambda for the second alternative. The code language is not clear. I think the  $f_{ct}$  in the equation should be measured average splitting tensile strength. Maybe Fred or Ken can explain to us how the equation in 8.6.1 is supposed to be used to choose lambda.

**It was agreed that the Code needs cleaning up here. Fred will follow up with ACI 213 and prepare a CA item. Note that CA 111 was assigned here. Status?**

5.15. Sulfate resistance: The following email was sent to Cathy French. Colin Lobo responded as shown.

I hope your sabbatical is going well. I had a question for you when  
> you have a minute. On our wind farm projects in some parts of the  
> country we are running into situations where we have severe sulfate  
> exposures and it seems that I am continually at odds with local  
> concrete suppliers over the interpretation of the sulfate resistance  
> portions of chapter 4 of ACI 318. Is this one of your fields of  
> expertise or can you recommend someone I could talk to so I can make  
> sure I am doing the right thing?  
>  
>  
>  
> The issue that I keep running into is that, the way I read section  
> 4.3, for severe sulfate exposures, type V cement is required. Type I  
> or II cement with the addition of class F fly ash can be used if the  
> mixture meets the requirements of section 4.5 when tested according to  
  
> ASTM C1012. The problem is that the test takes 6 months or a year to  
> run and I have yet to run into a concrete supplier who has run it on  
> any of their mixes. The suppliers that I talk to want to offer me a  
> test result from ASTM C452 but I have found multiple references in the  
  
> literature to the fact that this test is not accurate for mixes  
> containing cement blended with pozzolans. I have continued to insist  
> that the C1012 test be run if anything is to be substituted for the  
> type V cement but I seem to be the only engineer that these suppliers  
> are running into that is requiring them to do this.

Colin Lobo:

I will attempt a response. The sulfate provisions in the code are not ideal for compliance in practice.

In the footnote to table 4.3.1 "The amount of the specific source of the pozzolan or slag to be used shall not be less than the amount that has been determined by service record..."

This note permits the LDP to use customary practice on mix composition in lieu of test. It is realized the test duration is too long for mix submittals. It is unlikely that concrete suppliers will have C1012 data. It is more likely that blended cements by C595 or C1157 will have data in their certifications, but S3 requires additional SCM.

In CA for instance the use of 25% fly ash in addition to a sulfate resistant cement has been considered adequate for severe sulfate conditions. I think it is accepted by CALTRANS. I am not sure of the area of your projects, but slag as an SCM might be an option too. Slag has been entering the CA market more recently and these suppliers (as with the fly ash people) might have C1012 data but it wont be with the specific cement for the project. What is important in the cement would be the C3A used in the test relative to that used on the project. If that on the project is equal to or less than that used in the test, it should be OK.

ASTM C 452 is not an appropriate test - it is an optional test to qualify Portland cements for sulfate resistance only.

You might consult with Eric Tolles who is a code official for the city of Irvine in CA (if that's where you are operating). Eric is on 318 and aware of these provisions.

Does Sub A need to take action here? This item was not discussed in New Orleans, Chicago, Pittsburgh, Tampa, or Denver because of a lack of time. Status?

## 6. New Business:

Note that the following new business items are listed by title only because we will probably not have time to address them. If time is available or if a topic is of interest to a member, we will address these items.

6.1. Core waiting period.

6.2. Add recycled aggregate to the Code.

6.3. Top bar effects in self-consolidating concrete.

6.4. Fix mixture proportioning flow chart in Commentary.

This will be moot if CA 026 is adopted.

6.5. Various new work items resulting from review of Version 1 of the reorganized Code.

These items are being incorporated into the possible new work lists as chapters are adopted.

6.6. w/cm versus strength for durability.

6.7. Chloride ion restrictions in concrete containing aluminum embedments.

6.8. Request to add ASTM C 1600 Rapid hardening Hydraulic Cements to the Code. Note for Dallas: This has been moved into the Table for action.

6.9. Inquiry regarding appropriate strength for w/cm for durability.

6.10. Ward Malish issues regarding brackish water.

Note: None of these items have been addressed to date because of lack of time.

## 7. Adjourn