



"Terence C. Holland"
<terry@concreteterry.com>
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To Tony Fiorato <tony@fiorato.com>, Florian Barth
<fb@florian.com>, Ken Bondy <ken@kenbondy.com>, Nick
Carino <ncarino@roadrunner.com>, Fred Meyer
cc

bcc

Subject Agenda for Denver Meeting

Sub A members:

Following are the topics we will discuss and resolve during the Denver meeting. Please be prepared to lead the discussion as appropriate.

1. Resolution of negatives on Chapter 22 -- Nick. resolution of negatives on this chapter is currently on 318 LB 11-4, which closes on Monday 18 July. This should not be a major item because most of the negatives that were sent to 318 for resolution were relative simple. This should get Chapter 22 into the Code.
2. Plan for going forward with Chapter 5 -- Tony. The Commentary and list of new work items were sent to Tony some time ago. The list of new work items is attached to this email. We need to have a plan for incorporating the Commentary as well as addressing he most critical new work items.
3. CA 104 (Changes to freezing and thawing table) -- Doug. This Sub A ballot just closed and the comments are attached. Once we resolve the comments on the ballot, this item can be rolled into our plan for Chapter 5.
4. CA 026 (Dropping the prescriptive proportioning instructions) -- Terry. Comments from the last Sub A ballot will be discussed. These comments were sent out previously (8 Jun).
5. CA 113 (Definitions) -- Terry. Comments from the last Sub A ballot will be discussed. These comments were sent out previously (8 Jun).
6. Chapter 24 -- Terry. Discussion on how best to organize this chapter to allow working through the huge number of comments we have from 318 and Sub A.

Out meeting will be on Wednesday, 20 July, from 1:30 to 6:00 PM.

So far, no Sub A members have advised that they will not attend the meeting.

See you in Denver.

Terry



Chapter 5 New Business All .doc a05-2011_compiled_comments.doc

No.	Name	Pg #	Line #	Y/C or N	Comment
1.	Fiorato	0	Bkgd	Y/C	Editorial comment on Background – suggest changing the sentence “This could result in confusion, even though R4.3.1 already discusses this issue.” to read “Irrespective of the fact that R4.3.1 addresses this issue, it can lead to confusion.”
2.	Carino	0	0	C	We will need to create line numbers for the table as this item goes to future ballots.
3.	Carino	0	0	C	For completeness, we should show F2 in Table 4.3.1. If this get to Main ballot, we'd better show the complete Table otherwise there will be negatives.
4.	Holland	0	0	N	Whichever term we end up using, "critically saturated" or "saturated", must be adequately defined in the Commentary. A reference that is understandable by the practicing engineer (code user) would be a good addition.
5.	Holland	0	0	N	We must explicitly address the items of concern that have been raised -- footings and foundation walls that are performing well in service without meeting the current requirements.
6.	Weiss	0	0	Y/C	I approve this. If it is reworked and goes to ballot I would suggest rewording from 'is in critical saturation' to 'is likely to reach critical saturation'. Overall a very good change however
7.	Carino	1	1	C	In the B part of the background, should we also mention that ACI 201 recommends a minimum strength of 3500 psi for exposure to cycles of freezing and thawing if the concrete is drier than critical saturation.
8.	Bondy	2	Table	Y/C	Kinda bothered by the use of the term "critically saturated" in F2 and F3 (overly dramatic for a code term) but it is adequately explained in the commentary and I can't come up with anything better. Maybe someone else can.
9.	Carino	2	Table	N	In the description of F2 and F3, we use "critically saturated." If we are going to use this, then we need to define the term. Here is a first cut: "critically saturated—a condition in which more than 91 % of the volume of capillary pores in the paste fraction of hardened concrete are filled with water." Do we really need to make this fine point, or can we simply use "in a saturated condition"?
10.	Fiorato	2	Table	N	In thinking about the “Condition” statements in Table 4.2.1 it appears they may be somewhat misleading. If the concrete will be “critically saturated” it is unlikely that the limits in Table 4.3.1 will prevent freeze-thaw deterioration. Therefore, the following rewording is suggested: a. F1 – “Concrete exposed to freezing-and-thawing cycles and occasional exposure to moisture, but is likely to remain in an unsaturated condition.”

No.	Name	Pg #	Line #	Y/C or N	Comment
					<p>b. F2 – “Concrete exposed to freezing-and-thawing cycles and continuous contact with moisture that can result in a critically saturated condition.”</p> <p>c. F3 – “Concrete exposed to freezing-and-thawing cycles and to deicing chemicals or other external sources of chlorides, and in continuous contact with moisture that can result in a critically saturated condition.”</p>
11.	Lobo	2	F2	N	“in a critically saturated condition” seems to suggest an absolute condition that has to meet some measured criteria. Suggest revising to “that has a potential for being critically saturated in service conditions”. Also suggest that this be stated as portions of structural concrete members, because its unlikely that the complete cross-section of a member will achieve a saturated condition.
12.	Lobo	2	F3	N	Same comment as above. I also object to adding “or other external sources of chlorides”. This can mean concrete above splash zones in marine exposure etc. The limits on supplementary cementitious materials were established specifically for exposure to deicing chemicals, and has been considerably misused. This change will extend it to other possible service conditions where those limits may be inappropriate and even undesirable. Delete this part. I also feel that these should be specifically stated for structural concrete members. The general concern for this is potential scaling and cracking of concrete not resistant to freezing and thawing cycles, that will then result in corrosion of reinforcement. Plain concrete or un-reinforced concrete like slabs on grade (even though not covered by the Code) should not be subject to the 0.40 and 5000 psi requirements.
13.	Lobo	3	5	Y/C	Instead of unsaturated, suggest less than a critically saturated condition.
14.	Lobo	3	7	N	The biggest concern from the users is the interpretation that foundation walls and footings require 4500 psi. The commentary examples for F1 should include exterior walls or footings submerged in ground.
15.	Fiorato	3	8	N	suggest replacing “... is in a critically saturated condition...” with “...that can become critically saturated...”
16.	Fiorato	3	11	N	suggest replacing “..., in a critically saturated condition...” with “...that can become critically saturated...”
17.	Carino	3	13	N	Are we sure that critical saturation can be between 75 % and 90 % of saturation? I always thought that it was 91 %. In ACI 201, it says that if concrete has an internal relative humidity of 75 % to 80 %, it is sufficiently dry for immunity to damage by freezing and thawing. Does an RH of 75 % to 80 % correspond to 75 to 90 % of saturation? Can we provide some references? Are there other examples of situations where the concrete could be critically saturated when it is subjected to freezing and thawing?

No.	Name	Pg #	Line #	Y/C or N	Comment
18.	Lobo	3	13	N	Technically critical saturation is at 91.7% saturation. How is this translated to 70 to 90% of saturation?
19.	Fiorato	3	21	N	delete proposed addition of "Horizontal". Why is Section 4.4.2 limited to horizontal elements? While horizontal elements are most critical, other elements in structures such as parking garages can have problems if saturated by runoff of melting snow containing deicer salts. Also, as proposed addition of the word "Horizontal" means the Commentary would conflict with the Code provision which has no such limitation.
20.	Lobo	4	14	N	The last sentence needs to be better clarified that 4.4.2 is not applicable to anything other than for deicer salt. The term flatwork should not be used. Suggest: <u>The additional requirements in 4.4.2 are only intended for horizontal structural members assigned to an exposure class F3 where resistance to deicer salt scaling is of concern since this can reduce clear cover and result in initiation of corrosion of reinforcement. Requirements of 4.4.2 are not applicable to members assigned an exposure class C2.</u>

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Following ballots and reviews are included:

- Review of Version 1.0 (New Orleans Meeting, Nov 09)
- 318 LB 10-1 (Mar 10)
- Sub A 02-2010 (Jul 10)
- 318 LB 10-4 (Aug 10)
- TAC Review comments, 318-11 (Oct 10)
- Sub A 04-2010 (Dec 10)
- Sub A 01-2011 (Feb 11)
- 318 LB 11-2 (Mar 11)
- Public comments, 318-11 (Apr 11)
- Three CA items that have passed Sub A (CA 093, 101, and 104)

Section column refers to section number in “locked-down” version.

	Source	Who	Page	Line	Section	Comment
1.	TAC Comments		2548	1	5.1	Please replace throughout chapter 4 “weight” by “mass” as appropriate. New Business that will be addressed after reorg.
2.	A01-2011	Browning	1	14	5.2.1.1	All references to what needs to be in the contract documents should be moved to chapter 24. Revise to read “The value of f’c shall be specified in contract documents and shall be in ...” Not related. New business.
3.	A01-2011	Browning	1	24	5.2.1.3	All references to what needs to be in the contract documents should be moved to chapter 24. Contract documents are a list of directions to the contractor based upon the final design, not a list of design decisions generally found in the design calculations not available to the contractor. Revise to read “Unless a different test age is <u>used during design specified in the contract documents</u> , f’c shall be based...”, and move to chapter 24 what duration to use for testing. Not related. New Business.
4.	318 LB 10-4	Wyllie	2470	32	5.2.2	Regarding the second equation, as New Business, the Committee should define the density range considered as “normalweight concrete.” In ACI 318-08 the nonmandatory Commentary to the definition of “Concrete, normalweight” states “Normalweight concrete typically has a density (unit weight) between 135 and 160 lb/ft ³ , and is normally taken as 145 to 150 lb/ft ³ .”
5.	A04-2010	Holland			5.2.2	I am afraid that we will have to give in to Wyllie in order to get this chapter completed. We can either return to the present wording or put a change into the ballot for approval.

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						Accept (reluctantly). Propose that a mandatory density range for normalweight concrete be taken up as New Business (particularly as related to the calculation of modulus of elasticity). Is this Sub A?
6.	318 LB 10-4	Wood	2469	20	5.2.2.1 Table	Is it worth maintaining the lower limit of 2500 psi? Why not just use 3000 psi throughout ACI 318?
7.	318 LB 10-1	Frosch	1641	10	5.2.2.1 Table	As an item of new business, let's make the minimum concrete strength 3000 psi across the board. It will simplify this table and provide consistency.
8.	CA 093				5.2.4.1 Table	Justification for interpolation of Lambda
9.	318 LB 10-1	Frosch	1646	11	5.2.4.2	<p>Cmt # 67: The wording is awkward here. The tensile strength would be specified rather than being required as this is an alternate method of obtaining λ. In addition, should the ASTM be C496 rather than C330? Suggest rewording: The value of λ shall be permitted to be computed by Eq. (5.2.7.2). The average splitting tensile strength f_{ct} shall be specified, and laboratory tests shall be conducted in accordance with ASTM C330 to establish a value of f_{ct} corresponding to ' c_f '.</p> <p>ASTM C330 provides instructions on the number of specimens and the curing methods for determining the compressive and splitting tensile strengths of lightweight concrete specimens. So ASTM C330 provides the average compressive strength and average splitting tensile strength of the lightweight concrete. These values are used to establish the value of λ. The current Code provision 8.6.1 incorrectly states " If average splitting tensile strength of lightweight concrete, f_{ct}, is specified" because the intent is not to specify splitting tensile strength but to measure it.</p> <p>Sub A agrees with the voters for Comments 67 through 74. A change is being processed to address these issues. Because this is a major change, we prefer to propose the change using the normal process showing changes to the Code and Commentary along with supporting background information</p>
10.	Review of Version 1				5.2.4.2	<p>(318-08) 5.1.4 — Where design criteria in 8.6.1, 12.2.4(d), and 22.5.6.1 provide for use of a splitting tensile strength value of concrete, laboratory tests shall be made in accordance with ASTM C330 to establish a value of f_{ct} corresponding to f_c.</p>

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						<p>(Version 1) 5.2.9.2 — If the average splitting tensile strength of lightweight concrete, f_{ct}, is specified is required for the purposes of computing λ, λ shall be computed by Eq. (5.2.9.2) and laboratory tests shall be made conducted in accordance with ASTM C330 to establish a value of f_{ct} corresponding to f_c'. and λ shall be computed by Eq. (5.2.9.2).</p> <hr/> <p>Agree that f_{ct} is not specified. (Carino) Agree with the Task Group recommendation. Note the word "is" should not be deleted in the revision to Section 5.2.9.2. (Fiorato) Negative. Same comment as 5.1.1. (Holland) Discuss all in New Orleans New business regarding f_c and lambda. Search and restate correctly. Do we need different notation for measured compressive strength???</p>
11.	318 LB 10-1	Frosch	1646	19	5.2.4.3	<p>Is this the right location for this provision? Seems like this would be later, perhaps Chapter 22 since it is discussing field acceptance rather than design information.</p> <p>If we make the change in #67, we've eliminated the notion of a "specified f_{ct}." Then it is not necessary to mention that splitting tensile strength is not a basis for acceptance.</p>
12.	TAC Comments		2553	25	5.3 Comm	<p>In this paragraph please consider referencing other ACI documents dealing with special durability requirements due to severe exposures (ACI 350, 362, 349, and perhaps others).</p> <p>New Business that will be addressed after reorg.</p>
13.	318 LB 11-2	Wood	4427	76	5.3.1 Table	<p>Agree that the term "not applicable" is not appropriate for certain categories, but neither is the term "low." Sub A will consider new work item to delete the column labeled "Severity" and to reword 5.3.1 accordingly. Consider "benign"</p>
14.	318 LB 10-1	Cleland	1642	6	5.3.1 Table	<p>Table 5.2.4.1. Description of conditions for freezing and thawing is not clear. Does F3 require continuous exposure to deicing chemicals? What about occasional exposure to deicing chemicals?</p> <p>The definitions are unchanged from ACI 318-08 and it is agreed they could be improved. The current definitions are not clear that the freezing and thawing and moisture exposure have to occur simultaneously. Here are proposed revisions to consider:</p> <p>F1 - Concrete is subjected freezing and thawing and the concrete is sometimes moist during freezing and thawing. F2 - Concrete is subjected to freezing and thawing</p>

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						and the concrete is frequently in a saturated condition during freezing and thawing. F3 - The same exposure as F2 plus deicing chemicals are applied to the concrete. Revisions are being considered in CA104. This is new business.
15.	318 LB 10-1	Rogowsky	1642	6	5.3.1 Table	The definition for P1 exposure seems to be vague. How low is low permeability? Can it be quantified by test?
16.	A02-2010	Lobo		1	5.3.1	I think the requirements for concrete associated with exposure classes (maybe the most restrictive) should be specified in contract documents. It is not appropriate to assume the contractor knows what's applicable to exposure classes if they are written in the Code. This wording is taken directly from 318-08. Adding materials requirements could be taken up as New Business.
17.	TAC Comments		2549	1	5.3.1 Table	For a column in a building the exposure class is S0,F0,P0,C0. Would it not be simpler to have a class defined as 'N' that is no freezing and thawing / no sulphate / no corrosion protection needed and no concern over permeability? New Business that will be addressed after reorg.
18.	A01-2011	Carino	6	110	5.3.1 Table	So that it doesn't fall through the cracks, I want to restate that in our future changes related to improving the descriptions of the F exposure classes we also fix the footnotes to table 5.3.3.1. New business.
19.	CA 104				5.3.1 Table	Revisions to definitions for Exposure classes. Note that a task group (Hooton, Kosmatka, and Weiss) is further refining these definitions.
20.	318-11 Public Cmts	Sherman	3716	1	5.3.2 Table	Chapter 4 does not include any changes to the required concrete compressive strengths that relate to water-cementitious materials ratios; however, many engineers feel that the required minimum compressive strengths specified in Table 4.3.1 are higher than needed for the related w/cm ratios in the table, such that the strengths shown control concrete mix designs. I recommend that the following strengths be shown to correspond to the noted w/cm ratios: <ul style="list-style-type: none"> • 3500 psi for 0.50 w/cm • 4000 psi for 0.45 w/cm • 4500 psi for 0.40 w/cm Note: I've attached a copy of documentation for these recommendations that I had submitted to the ACI 318

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						Committee by email on 9/20/2010. [Staff Note: Correspondence on file at Headquarters, if needed.]
21.	CA 101				5.3.3	Issues regarding measuring air
22.	A02-2010	Carino		37	5.3.3.1 Table	I disagree with the proposed Staff revision of moving the text in parentheses to the end of the note. It has changed the meaning. As written in the current Code, the tolerance is on the measured value. Revise as follows: "When testing concretes, however, aggregate particles larger than 1-1/2 in. are removed by sieving and air content is measured on the sieved fraction. Tolerance on air content as delivered applies to this measured value." If the Staff revision is the intent of the provision, then it's new business because we are making a technical change that needs to be discussed. Return to 318-08. Make changes in CA 101.
23.	318 LB 10-1	Anderson	1645	5	5.3.3.2 Table	Table 5.2.5.2, last footnote in the table. Isn't this footnote essentially a repeat of the first and third lines of the table? I realize this is a direct copy of the 318-08 version, but perhaps we should clean this up? <i>The last footnote is intended to clarify that when fly ash and silica fume are used together, each component cannot exceed its individual limit. For new business, consider removing the fourth row from the table, because it is clear that one can have a total of 35 % SCMs composed of 25 % FA and 10 % SF.</i>
24.	TAC Comments		2556	20	5.3.3.2 Table	These limits are based on scaling of horizontal surfaces, and are more than 20 years old. The limits are quite conservative as the only distress reported is scaling. There is a lot of evidence of good performance of concretes which exceed these limits. The limitations should reflect that they are only applicable to horizontal surfaces. New Business that will be addressed after reorg.
25.	A01-2011	Lobo	7	119	5.3.4 Table	Technically the term "alternative" to Table 4.3.1 is not appropriate, since one of the options for S3 is to use these criteria to qualify a cementitious combination. Further, concrete that contains only portland cement in accordance with C150 will not qualify for these expansion criteria and specifiers invoke this requirement. C150 cements are tested (optional) to C452. Suggest changing title to- "Qualification of cementitious materials by testing for sulfate resistance"

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						Not related. New Business.
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