

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]

Toronto Meeting
Tuesday, 22 October 2012, 1:30 PM to 6:00 PM, Meeting Room Elgin

DRAFT AGENDA

1. Call to order at 1:30 pm.
2. Introductions.
3. Approval of Agenda.
4. Approval of Minutes. Dallas meeting, 20 March 2012
5. Old Business:
 - 5.1 Ballot A04-2012. This ballot was for Sub A only members. It covered the commentary for Chapter 22 and CA 114, editorial changes in the Code of Chapter 22. These same items were on the 318 LB 12-3. Comments on this ballot were resolved with comments from 318 LB12-3. Proposed responses to 318 LB 12-3 and A04-2012 were balloted on A06-2012. **No further action required.**
 - 5.2. Ballot A05-2012. This ballot was for Sub A only members. It covered the commentary for Chapter 5, CA 115, editorial changes to the Code in Chapter 5, and CA 116, changes related to calculating Lambda. The proposed responses to the comments received on this ballot were included on A07-2012. **No further action required.**
 - 5.3. Ballot A06-2102. This ballot was for all Sub A members. It covered proposed responses to 318 LB 12-3 on the Commentary for Chapter 22 and CA 114. It also covered proposed responses to the Sub A only member ballot on these items (A04-2012.) All open issues were resolved during the Detroit 318 meeting. Final versions of the responses, Chapter 22 with Commentary, and CA 114 were sent to Sub A by email on 10 July 12. **No further action required.**
 - 5.4. Ballot A07-2012. This ballot was for all Sub A members. It covered the proposed responses to 318 LB 12-4 on the Commentary to Chapter 5, CA 115, and CA 116. It also covered the proposed responses to A05-2012 on these same items. These responses were covered in a Sub A teleconference on 20 July 2012. **These responses have been incorporated in the proposed responses to 318 LB 12-4. See 5.8.2, below.**
 - 5.5. Ballot A08-2012. This ballot was for all Sub A members. It covered CA 117, which was the report of the Sub A task group evaluating the proposal to add C1600 cements to the Code. The task group concluded that there was not enough information upon which to make a decision regarding whether these cement should be added to the Code. This conclusion was forwarded to the proponent. He has responded that he is gathering the information and plans to revisit the request. **No further action required.**
 - 5.6. Ballot A09-2012. This ballot was for Sub A only members. It covered the Chapter 23 Code. This Code language was also balloted on 318 LB 12-7. A total of 765 comments were received on both ballots. **The way forward for Chapter 23 will be discussed later in the meeting.**
 - 5.7. Summary of all CA items. An updated list of all CA items is **enclosed**. This list This list currently shows 19 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. Following are changes since the Dallas meeting:

CA 114 – Editorial changes to Chapter 22 Code. Passed during Detroit meeting.

CA 115 – New. Editorial changes to Chapter 5 Code. Passed Sub A; on 318 LB 12-8. To be resolved this meeting.

CA 116 – New. Fix Lambda calculations, Chapter 5. Passed Sub A; on 318 LB 12-8. To be resolved this meeting.

CA 117 – New. Add C1600 cements to Code. Sub A agreed to send request for additional information to the proponent for this action. No further action pending response.

CA 104 – Various changes to Tables 5.3.1 and 5.3.2, Exposure Classes, and associated commentary. This proposed change is on hold pending completion of Chapter 5 Commentary. Once that is complete, CA 104 will be revised to reflect a change from the reorganized version. It will be sent to Sub A for a short-period ballot and then sent to 318 for ballot.

5.8. Code reorganization.

5.8.1 Task Groups for Code Reorganization. Following are the current Task Groups.

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

5.8.2 Current Status:

Chapter 5 – Remaining negatives from 318 LB 12-4, A05-2012, A07-2012 on CA 114, CA 115, and Commentary will be resolved during this meeting. A copy of the proposed responses to 318LB 12-4 and A05-2012 is enclosed. Responses to A07-2012 are enclosed as well.

Chapter 22 – Code and Commentary are locked down.

Chapter 23 – Code was on 318 LB 12-7 and A09-2012 (Sub A only members.) A total of 765 comments were received. Colin and Terry tagged the comments as editorial (E), technical (T), and philosophical (P). A copy of the file with all of the tagged comments is enclosed. This breakdown resulted in the following:

Editorial: 113
Technical: 574
Philosophical: 78

Colin, Terry, Dean, and Ken Bondy have been addressing the P comments to develop recommendations to take to the Steering Committee on Monday afternoon. Terry will report on the decisions from the SC.

Colin, Florian, Harry, and Ken Hover have been reviewing the T comments. This is a first pass review to identify significant technical issues. Final work on the T comments will commence once the future direction of the chapter is adopted. Colin to report on progress on the T comments.

5.8.3 New business for adopted chapters:

Chapter 5 – Tony to report.

Chapter 22 – Nick to report.

The following items have been carried over for several meetings and will be discussed as time permits.

5.9. 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?**

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

5.11. 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.**

5.12. 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.

This issue is being addressed as CA 116 as reported above. Further work remains on lambda versus unit weight issues, which is being addressed as CA 111. Also, the question of whether the method of calculating lambda is actually used by designers has been raised as new business for Chapter 5. This item will not appear in future agendas.

5.13. 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 won't 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?

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.

The flow chart in question has been removed from the Commentary with the passage of CA 026. This item will not appear on future agendas.

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.

This item is being covered by CA 117. This item will not appear on future agendas.

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

6.10. Ward Malish issues regarding brackish water.

Note: Except as noted, these items have not been addressed to date because of lack of time.

7. Adjourn

No.	Name	Comment #	Y/C or N	Comment	
1.	Lobo	11	Y/c	Maybe we should change “probabilistic” “statistical”	No change proposed. Probabilistic has been in the Code for some time and the meaning is clear.
2.	Lobo	12	Y/C	Seems like a summary dismissal of comment. Suggest changing response to: Sub A feels the wording is appropriate since the probability of meeting the acceptance criteria is 99%.	See revised wording of response.
3.	Lobo	18	Y/C	Is this provision being deleted or moved to Ch 22? It seems like a useful provision to retain (possibly in Ch 22) if we maintain that lambda can be determined from splitting tensile tests.	Suggest that it be deleted, not moved. See Carino Comment No. 4 in A05-2012.
4.	Lobo	20	N	I disagree with the proposed reorganization. The flow of these paragraphs is appropriate – what impacts durability, why w/cm cannot be verified and why we cannot specify for lightwt.... I suggest changing the response to: Sub A feels the flow of this commentary section is fine.	Persuasive. See response to Wood Comment 20.
5.	Carino	21	N	As I mentioned in my comment (#6) on the sub ballot, the term “durability characteristics” is vague. In this situation, we are talking about resistance to fluid penetration. I suggest we revise the proposed wording as follows: For a given w/cm, the substitution of portland cement by fly ash, slag cement, silica fume, or a combination of these materials, will typically increase concrete’s resistance to fluid penetration.	Persuasive. See response to Kopczynski Comment 21.
6.	Lobo	21	N	Do not support the term “substitution”. Suggest using “inclusion”	Persuasive. See response to Kopczynski Comment 21.
7.	Carino	24	C	We should ask Staff to address the use of “this Code” and “the Code” in the editorial guidelines.	Yes
8.	Carino	25	N	I think this sentence is written awkwardly and it can be improved as follows: ASTM C1202 ^{5.5} can be used to provide an indication of concrete’s resistance to fluid penetration.	Persuasive. See response to Parra Comment 25.
9.	Hover	28	Y/C	Suggested response: Nonpersuasive. Given that there is a reliable relationship	Persuasive. Response to Kopczynski Comment 28 should address this comment.

No.	Name	Comment #	Y/C or N	Comment	
				between strength and w/cm for any given mixture, and given that consistently reliable methods for evaluating w/cm of fresh concrete are unavailable, the strength requirement should not be waived.	
10.	Lobo	32	Y/C	I tend to prefer retaining some of this deleted text because its another reason for the LDP to not specify f'_c that is not consistent with w/cm. Suggest something like: <i>The emphasis on acceptance of concrete is on strength tests. When strength test results are substantially higher than that required for a lower value of f'_c that is not consistent with the specified w/cm, there is no method of assuring that concrete at the required w/cm is being furnished.</i>	Per 7/20/12 Sub A Conference Call, agreed to delete the sentence.
11.	Carino	34	C	To be accurate, I suggest we add “maximum permitted” in front of w/cm, so that it reads: In this case f'_c should be specified at 4,500 psi or greater to be consistent with the maximum permitted w/cm. See Table 5.3.2.”	Accepted. Change made.
12.	Weiss	35	Y/C	The water absorbed by the LWA can be estimated using sorption and desorption analysis. I agree that it is uncertain however technically speaking this is the same for NWA. I think that currently this uncertainty is an unknown and can stay this way now but this may be something to address.	See response to Dolan Comment 35.
13.	Carino	37	C	Perhaps, we should add “See also response to Carino #9 on Sub A ballot.”	ACI 318 Main would not have ready access to Sub A ballots.
14.	Carino	41	N	I think we can make it more precise as follows A classification of “0” is assigned if the exposure severity has negligible effect (is benign) or the exposure category does not apply to the member..	Accept. See response to French Comment 41.
15.	Carino	43	N	I do not agree with the comment by French. The word permeate does imply flow through the concrete. I think we can clarify the intent by removing “permeability” and focus on “penetration”:	Negative withdrawn 7/20/12. See CA 104

No	Name	Comment #	Y/C or N	Comment	
				Exposure Category P is subdivided into two exposure classes: Members are assigned to Exposure Class P0 if they are dry in service, exposed to moisture or in contact with water, but there are no specific requirements for resistance to water penetration. Exposure Class P1 is assigned if there is need for concrete with resistance to water penetration if water penetration might reduce durability or affect the intended function of the member.	
16.	Carino	44	C	Should we change the wording to: Exposure Class P1 is assigned if concrete with resistance to water penetration is required but the other exposure classes do not apply. If we make this change do we need the previous sentence?	Sentence deleted. See response to Frosch Negative No. 44.
17.	Lobo	44	Y/C	Suggest changing wording to: Exposure Class P1 will assign some restriction on the permeability characteristic of concrete when other exposure classes do not apply.	Sentence deleted. See response to Frosch Negative No. 44.
18.	Carino	48	C	I agree that this part of the Commentary should be reviewed critically for New Business and repetition of code provisions should be deleted. Could it be combined with CA104?	New Business
19.	Lobo	48	Y/C	I tend to agree with the comment and its possible that the commentary can be simplified to avoid repeating code provisions in words.	New Business
20.	Carino	51	C	To be clear we could augment the response to: Delete “structural”.	Agree. See response to Gustafson Comment 51.
21.	Carino	55	C	The comment applies to line 291. I agree with the suggestion: The project specifications should explicitly cover special cases.	Agree. See response to Gustafson Comment 55.
22.	Lobo	55	Y/C	Possibly he is referring to “all” on line 291.	Agree. See response to Gustafson Comment 55.
23.	Carino	56	C	Do not make the suggested change. It reads better with “it” because “it” refers to the “type”. Should we add ASTM in front of C1157? The appropriate types under ASTM C595 ^{5,7} are IP(MS) and IS(<70)(MS) and under ASTM C1157 ^{5,8} it is Type MS.	Agree. See response to French Comment 56.
24.	Carino	57	C	This Commentary is paraphrasing the Note in Line 252. So I think the “alternative” is discussed. Note that there is	Agree. See response to Frosch Comment 57.

No	Name	Comment #	Y/C or N	Comment	
				an error in line 256: The reference should be to 5.3.4.1.	
25.	Lobo	57	Y/C	Possible revision: For Exposure Class S3, the alternative allows the use of blended cements or Type V portland cement plus pozzolan, slag cement, or blended cement, based on records of successful service, <u>is permitted</u> instead of meeting the testing requirements of 5.3.4.	See response to Frosch Comment 57.
26.	Carino	59	N	This is covered in the Note on line 247. So it is not taking an exception to the Code. One could argue that it's in the Commentary to highlight the Note, which might otherwise be missed.	Persuasive. See response to Frosch Negative 59.
27.	Carino	61	N	I agree with the comment. Nowhere in the Code do we mention the benefit of AE for resistance to sulfates. I recommend we delete it as a response to the comments.	Persuasive. See response to Becker Comment 61.
28.	Carino	63	N	See also Carino comment #17. I propose the following revision to get rid of "permeability": Exposure Class P1: The Code includes an Exposure Class P1 for concrete that needs to have resistance to water penetration if in direct contact with water and the other exposure conditions defined in Table 5.3.1 do not apply. The primary means to obtain higher resistance to water penetration is to use a lower <i>w/cm</i> . For a given <i>w/cm</i> , higher resistance to water penetration can be also achieved by optimizing the cementitious materials used in the concrete mixture.	Negative withdrawn 7/20/12. See CA104.
29.	Lobo	63	Y/C	Suggest revision: ...when in direct contact with water, <u>Exposure Class P1 provides the least restrictive limit on <i>w/cm</i> and where the other exposure conditions, with the exception of C1, defined in Table 5.3.1 do not apply.</u>	Negative withdrawn 7/20/12. See CA104.
30.	Carino	68	N	The Code defines the permitted types of coatings, so rather than trying to list the various types of coatings, can we say: Coated bars, bars of corrosion resistant steel, cover greater than the minimum required in 6.11.5, or a combination of these may be desirable.	Persuasive. See response to French Negative 66.
31.	Carino	69	N	The use of "and/or" is not good style. See the response to comment 68 for a possible solution.	Persuasive. See response to French Negative 66.

No.	Name	Comment #	Y/C or N	Comment	
32.	Carino	70	C	Can we change the response to “No change because the balloted title is more descriptive of the subject being discussed.”	See response to French Comment 70.
33.	Hover	75	N	<p>Suggested response:</p> <p>Leave the word “required”.</p> <p>The term “target” implies that some undefined approximation to the table value is satisfactory, Further, the term “target” implies that higher air than the table values is just fine, but the problem is that the higher the air the lower the strength and the more cement and or admixture will be needed to compensate. Finally, in the context of the history of Chapter 4, the term “Target” is connected with the “Target compressive strength,” and may imply some similar statistical approach that will result in air contents considerably higher than needed. For a reasonable air-void system as developed with modern admixtures, the air content values in the table are already conservative. (See Canada’s A23 spec for 3% air in place with proper voids.)</p>	As agreed on 7/20/12, see response to Anderson Comment 75. Delete “required” with no replacement.
34.	Carino	76	C	Aren’t we addressing this in CA104 where we will be making reference to critical saturation?	Agree. See response to Rogowsky Comment 76.
35.	Hover	76	Y/C	When the time comes for such discussion in Sub A: There may be some confusion here with the principle that air is not needed in any zone of the concrete UNTIL the concrete in that zone is “critically saturated,” i.e., there is not enough room left in the pores to accept the expansion of the ice. Rogowsky may be referring to Figure 7.12 of Neville (3rd Ed., p. 463) where it is shown that non air-entrained concrete is “highly resistant to frost” at levels of saturation below 85 to 90%.” Air entrainment is needed at higher degrees of saturation.	See response to Rogowsky Comment 76.

No	Name	Comment #	Y/C or N	Comment	
				Unless concrete is pressure-saturated, the natural water-repellency of the air voids keeps them empty. The voids can be made worthless if filled with water under pressure, ASR gel, DEF goop, or shredded re-org code pages.	
36.	Lobo	76	Y/C	This is an academic discussion that is not relevant to ACI 318 commentary. It is very unlikely that the entrained air voids are saturated with water in structures built by 318 and if there are such submerged members, it is unlikely that these will witness freezing. It is appropriate to caution that concrete containing non-durable aggregates will not be protected from distress by entraining air in the paste.	See response to Rogowsky Comment 76.
37.	Weiss	76	Y/C	Regarding 76 I believe we addressed this. The 84to86% critical saturation that we added was to discuss this.	See response to Rogowsky Comment 76.
38.	Carino	80	C	I think the confusion comes from the words “Optional Designation”, which are not used in the Code. Do we need them? Can we just have (MS)?	See response to Dolan Comment 80.
39.	Lobo	81	Y/C	I think it is as recommended in ACI 201.2R. We are just stating that these limits for S1 and S2 are consistent with MS and HS qualifications for blended cements and there is no equivalent for S3 in the cement standards.	Agree. See response to Frosch Comment 39.
40.	Carino	84	N	I am confused by the Comment. Is the intent to not list in the commentary reference list those ASTM standards that are listed in Chapter 3? I’m not sure of the meaning “to assist the staff who will move them to Chapter 3.”	See response to Wyllie Comment 84.
				The following comments refer to A05-2012.	
41.	Lobo	1(A)	Y/C	There is precedent where a value used for design is then used as an acceptance test – flexural strength for pavements.	No change proposed.
42.	Carino	1(A)	N	I still think we can make an improvement (This includes the change from comment 29 by Wood and excludes the change in response to Wyllie #34): Because it is difficult to verify the w/cm of concrete accurately,	Persuasive. See response to Wood Comment 29.

No .	Name	Comment #	Y/C or N	Comment	
				the selected value of f'_c should be consistent with the maximum w/cm permitted for durability. Selection of an f'_c value that is consistent with the maximum w/cm permitted for durability will allow results of strength tests to be used as a surrogate for w/cm , and thus help ensure that the maximum w/cm is not exceeded in the field. For example, a maximum w/cm of 0.45 and f'_c of 3000 psi should not be specified for the same concrete mixture.	
43.	Carino	1(A)	N	The line number should have been 175. I still believe that this sentence is not needed. What would be lost if it were deleted?	Persuasive. Delete the sentence.
44.	Carino	1(A)	N	The referenced line number should be 272. The point that I am trying to make is that the Commentary should not use the word “should” when referring to a code requirement. The concrete has to be air-entrained when exposed freezing and thawing. The word “should” implies it’s optional. I think this stems from the idea that the Commentary should not be written in mandatory language. The Commentary has to reflect what the Code requires. So the text should be changed as follows: “...concrete for members subject to freezing and-thawing exposures is to be air entrained in accordance with 5.3.3.”	Persuasive. Make the change.
45.	Carino	1(A)	N	The rationale is same as for my Comment #10. The line number reference should be 277. What I meant to say is to change the wording to: “... is to be made with sulfate-resisting cement.” Now that I read this, should it be changed to “sulfate-resisting cementitious materials.”?	Persuasive. However the change made has been to delete the first sentence starting on Line 277.

Sub A Responses to Comments for ACI 318 Ballots LB12-4 and ACI 318A Ballot A05-2012

As of October 9, 2012

Comment Number	Last Name	Submittal #	Line #	Vote: Y C* N** A	Comments	Responses
1.	Taylor	CR055	0	C	General editorial comment: the symbol f'_c is not properly formatted in many places in this ballot.	Staff editors to review and change.
2.	Corley	CR055	18	C	Change "shall govern the" to "shall apply to". This is not clear. Changes to the code are made but we are not voting on them here or do I vote here and on CA115?	This is part of CA115 ballot item.
3.	French	CR055	31	C	I think Charlie had asked that shells be retained for 318.1 reference in Chapter 6. Whatever is done with regard to the shells references, we should be consistent.	This is a global issue. Refer to Steering Committee.
4.	Dolan	CR055	33	C	I checked 318.1 and concrete strength is called out in the document so I have no objection to dropping it here.	OK. See response to French Comment 3.
5.	French	CR055	45	C	Change "when" to "as"	Agree. Make the change.
6.	Gustafson	CR055	45	C	Consider replacing "defined" with "prescribed".	Change "defined" to "required".
7.	Dolan	CR055	49	C	Delete the period before f'_c .	Make the change.
8.	Taylor	CR055	49	C	Extra period after "value of"	Make the change
9.	Anderson	CR055	50	C	Fix font for f'_c throughout.	Staff editors to review and change.
10.	French	CR055	50	C	Italicize " f'_c "	Staff editors to review and change.
11.	Wood	CR055	50	C	"Probabilistic concepts" sounds rather sophisticated for what we are doing.	No change as the meaning is clear. This terminology is from ACI 318-11. It has been used in the Code since 1971. (Apparently we have been sophisticated for a number of years.)
12.	Dolan	CR055	52	C	Replace "a high" with "an acceptable" since acceptance criteria are provided and high criteria are not.	No change as the meaning is clear and the intent is to indicate more than just an

						“acceptable” level.
13.	Wood	CR055	57	N	The paragraph about lightweight concrete in special moment frames and special structural walls is out of place in Chapter 5 and should be deleted.	Nonpersuasive. It does not seem unreasonable to include this Commentary in Chapter 5, which contains 5000 psi design strength limit for seismic in Table 5.2.1.1. This location was requested by Sub H. Withdrawn by email 5 Oct 12.
14.	Gustafson	CR055	58	C	Consider replacing “forces” with “effects”.	No change. Terminology from ACI 318-11.
15.	French	CR055	80	C	Italicize “ E_c ”, I believe the format for references is changing to (author year). Please fix throughout.	Staff editors to review and change.
16.	French	CR055	81	C	Italicize “ f'_c ”	Staff editors to review and change.
17.	Wood	CR055	84	C	Suggest returning to the original language of “for determining the modulus.”	Agree. Make the change.
18.	Frosch	CR055	130	N	This negative goes back to my comment that is listed as #74 on page 6845. The provisions of this section give design properties. This provision and commentary definitely seem out of place as it is discussing field acceptance. It seems that 22.5 is the correct placement of this provision as that section is on “evaluation and acceptance of concrete”.	Persuasive. This negative deals with the Code and has been transferred to CA 116 for resolution. The provisions in question were deleted by passage of CA 116. This negative has been withdrawn by email as part of CA 116.
19.	Dolan	CR055	133	C	Replace () with commas.	See response to Frosch Comment 18.
20.	Wood	CR055	156	C	There are five paragraphs in this section, and the order seems to be rather awkward. I recommend the following: (1) retain the first paragraph, (2) move the fourth paragraph to #2, (3) move the fifth paragraph to #3, (4) move the second paragraph to #4, and (5) move the third paragraph to 5.3.2.	Sub A believes the current organization of the section is appropriate. No change is proposed.
21.	Kopczynski	CR055	159	C	Suggest third sentence be replaced with “For a given w/cm, the substitution of fly ash, slag cement and silica fume for portland cement will improve concrete durability	Agree. Make the change as follows: “For a given w/cm, the use of substitution of portland cement by fly ash, slag cement, silica fume, or a combination of these

					characteristics.	materials, will typically <u>increase concrete's resistance to fluid penetration</u> and thus improve concrete durability characteristics."
22.	Frosch	CR055	160	C	Insert comma after "slag cement"	Agree. See response to Kopczynski Comment 21.
23.	Gerber	CR055	160	C	The following revision is proposed: <i>slag cement and silica fume may improve these characteristics of concrete at the same w/cm</i> Reason: The statement implies that blends of cementitious materials always improve the concrete over Portland cement mixtures. I don't believe this is certain in all cases.	Agree. See response to Kopczynski Comment 21.
24.	Sanders	CR055	161	C	Change "This Code" to "The Code" since this is in the commentary.	Global editorial.
25.	Parra	CR055	163	C	Change "is" to "can be found in".	Make the following change: "ASTM C1202 ^{5.5} can be used to provide an indication of concrete's resistance to fluid penetration."
26.	Becker	CR055	165	C	I would suggest that lines 165 through 177 would be more appropriate in R5.3.2 inserted at line 269. This commentary would then be easier to find as one is thinking about Table 5.3.2. I would suspect that few people read introductory commentary and could miss this valuable information.	See response to Wood Comment 20 on Line 156.
27.	French	CR055	165	C	Italicize " f'_c ", there are a number of instances where notation should be italicized...I began pointing it out, but am providing this as a general comment to avoid repetition. Sub A or staff should search and replace to fix format of notation.	Staff editors to review and change.
28.	Kopczynski	CR055	165	N	In remote regions (some areas of Alaska, for example), ready-mix plants become leery of mixes with overly high specified compressive strengths and price them unnecessarily high. In these instances, it is sometimes advantageous to specify a lower compressive strength	Nonpersuasive.1. We should not encourage an inappropriate practice. 2. LDP is free to deviate from Code as provided for in 1.10.

					<p>than is consistent with w/cm requirements. The special inspector is then made aware of the need to monitor the mix proportions as concrete is delivered to the site.</p> <p>I suggest changing the first sentence to "...should normally be consistent with..." Also, I suggest deleting the last sentence and replacing it with "If the specified w/cm and compressive strength are inconsistent; for example, a w/cm of 0.45 and compressive strength of 3,000 psi; the licensed design professional should monitor mix proportions of the delivered concrete, either directly or through the special inspector."</p>	
29.	Wood	CR055	165	C	Is it possible to reword the first sentence to avoid the split infinitive? "Because it is difficult to verify the w/cm of concrete accurately, ..."	Agree. Make the change. See also response to Carino Comment 8 on Line 165 from A05-2012 (shown below).
30.	Frosch	CR055	169	C	Would it be clear to most users why this is the case? Perhaps another sentence could be added to explain.	See response to Wyllie Comment 34.
31.	Wood	CR055	169	C	This sentence seems out of place, as the table with w/cm ratios is in 5.3.2.	Sub A prefers to keep this discussion in the general section 5.3.
32.	French	CR055	170	N	<p>This part of R4.1.1 is missing: Because the usual emphasis during inspection is on concrete compressive strength, test results substantially higher than the specified compressive strength may lead to a lack of concern for quality and could result in production and delivery of concrete that exceeds the maximum w/cm.</p> <p>This portion of the text implies that it is not sufficient to specify concrete compressive strength alone, but that the specified f'_c should be consistent with the w/cm.... With the omission of this text, it implies that you would not specify both w/cm and f'_c – but I think the intent is that you would not specify a w/cm of 0.45 and f'_c of 3000psi, rather you would specify 4500psi with that w/cm</p> <p>This discussion seems to fit better with 5.3.2 than with 5.3 in general. Lines 172 through 177 also belong with 5.3.2.</p>	<p>Nonpersuasive. The sentence was deleted because it is not clear. The voter's concern is covered by the following sentence in R5.2.1 (Line 52 of the Ballot):</p> <p>"The durability requirements prescribed in Table 5.3.2 are to be satisfied in addition to meeting the minimum specified strength requirements of 5.2.1. Under some circumstances, durability requirements may dictate a higher design strength than that required for structural purposes."</p> <p>See also response to Wyllie Comment 34.</p> <p>Sub A prefers to retain Lines 172 through 177 at the balloted location in the more general section of the Commentary. See</p>

						response to Dolan Comment 35. Negative withdrawn by email 5 Oct 12.
33.	Rogowsky	CR055	170	C	The commentary tells us what should not be done. I suggest that we add a sentence to tell us what should be done. Consider adding "While one may choose to perform the structural design calculations with f'_c of 3000 psi, the specification should reflect the minimum compressive strength in Table 5.3.2 that would typically correspond with a w/cm of 0.45, which in this case would be 4500 psi."	See response to Wyllie Comment 34.
34.	Wyllie	CR055	170	N	To help the not so bright reader, suggest adding something like: "For this condition f'_c should be specified at 4,500 psi or greater. See Table 5.3.2."	Persuasive. Make the following technical change: "In this case f'_c should be specified at 4500 psi or greater to be consistent with the maximum permitted w/cm. See Table 5.3.2."
35.	Dolan	CR055	172	C	Suggest rewrite to avoid () 173 As stated in the footnote to Table 5.3.2, maximum w/cm limits are not specified for lightweight concrete (as stated in the footnote to 473 Table 5.3.2).	Agree. Make the change and combine with response to Gerber Comment 36 to read as follows: "As stated in the footnote to Table 5.3.2, maximum w/cm limits are not specified for lightweight concrete because the amount of mixing water that is absorbed by lightweight aggregates makes calculation of the w/cm uncertain."
36.	Gerber	CR055	172	C	Lines 172-173. Some editorial clarifying revisions: <i>Maximum w/cm limits are not specified for lightweight concrete (as stated in the footnote to Table 5.3.2).</i> The uncertainty in determining because <i>the amount of mixing water that is absorbed by lightweight aggregates makes calculation of the w/cm uncertain.</i>	Agree. See response to Dolan Comment 35.
37.	Parra	CR055	177	C	Consider changing "high quality" to "the necessary quality".	No change as the meaning is clear.
38.	Dolan	CR055	186	C	The commentary is lengthy and almost textbook like. However, the material warrants this discussion, especially for users who are not familiar with a lot of mixture behavior. I would object to significantly reducing the content.	No response required.

39.	French	CR055	193	C	Missing reference to the table (see ACI 318-11)	No change. Wording is consistent with the other exposure categories. ACI 318-11 wording was not parallel.
40.	Frosch	CR055	198	C	Consider changing “reinforced” to “nonprestressed”. Also in Table 5.3.2 (title of column), line 234, 317, 330, 348. Throughout the reorganized code, the word “nonprestressed” is being used rather than “reinforced”.	Make the change (assumes new terminology is approved).
41.	French	CR055	203	N	Change “or there is no requirement” to “or does not apply to the structural member”	Persuasive. Make the following editorial change: A classification of “0” is assigned if the exposure severity has negligible effect (is benign) or the exposure category does not apply to the member.” Negative withdrawn by email 5 Oct 12.
42.	Anderson	CR055	211	C	We provide more than one example, yet the verb tense is singular. Suggest: “An example is Examples are an exterior water tank or vertical members in contact with soil.”	Make the change.
43.	French	CR055	228	N	Change “through” to “into” as in ACI 318-11...”through” implies the water has to go all the way through rather than just permeate into the concrete.	Persuasive. Make the editorial change. Negative withdrawn by email 5 Oct 12.
44.	Frosch	CR055	230	N	What does it mean “when other exposure classes do not apply”. If there are only two classes, shouldn’t it be “when exposure Class P0 doesn’t apply? Are we talking about some other exposure class? Isn’t an exposure class assigned for every category? Something is wrong here.	Persuasive. Agree that this sentence may cause confusion. It is existing wording from ACI 318-11 and was intended to indicate that P1 applies to structures in this category (“In contact with water when low permeability is required.”) unless another exposure class is more critical for that structural element. However, the sentence is not really needed. Therefore, it is proposed to delete the sentence: “Exposure Class P1 is assigned when other exposure classes do

						not apply” as an editorial change. Negative withdrawn by email 5 Oct 12
45.	Gustafson	CR055	230	C	The last sentence should be embellished, or perhaps it ought to be deleted. What is an “interior water tank”? Also Line 229 speaks of “the member”. It seems to be a stretch to characterize an “interior water tank” as a “member”.	This is current Code wording. Sub A is proposing revisions to the Code and Commentary for this section under Code Change CA104.
46.	Frosch	CR055	262	C	Consider “provides the requirements” rather than “gives ..”	Make the change.
47.	Jirsa	CR055	262	C	Suggest rewording “The requirements for concrete are given in Table 5.3.2 based on the assigned exposure classes.”	See response to Frosch Comment 46.
48.	Wood	CR055	262	C	This section is quite long, and it repeats a lot of material that is in the code. The table in the code presents the information in a succinct manner, while the commentary says the same thing in words. Recommend that Sub A review this section carefully and eliminate duplication.	This comment has merit and Sub A will address it as New Business.
49.	French	CR055	263	C	Change “When” to “If”	See response to Frosch Comment 50.
50.	Frosch	CR055	263	N	“When ... assigned more than one.” This wording makes it sounds that exposure classes don’t need to be assigned for each type. Suggest deleting the lead-in phrase as stating as: “The most restrictive requirements are applicable.”	Persuasive. Make the editorial change. Negative withdrawn by email 5 oct 12
51.	Gustafson	CR055	263	C	Lines 263, 271 and 272 speak of “structural concrete members”. But Lines 225 and 229 speak of “member”. Line 390 speaks of “members”. Should make the terminology consistent. Article 3.2.3 in the Editorial Guidelines states: “The adjective ‘structural’ is generally unnecessary where describing members or concrete. Use the adjective “nonstructural” where appropriate.”	Make the changes. Delete “structural.”
52.	Anderson	CR055	266	C	Add Class reference: “In this case, the requirement for corrosion protection (C2) is more . . . “	Make the change.

53.	Novak	CR055	270	N	<p>Exposures F1 and F2 limit f'c to 4500psi. This was added in ACI 318-08 and engineers/contractors are just becoming aware.</p> <p>As part of the code update seminars last fall and this spring, many engineers and contractors have expressed great concern for this 4500 psi limit.</p> <p>They want to know if this limit applies to footings and below grade piers on footings. If it applies to footings, they also want to know "why" it applies as typically, even in cold climates, engineers have historically used 3000 to 4000 psi concrete for footings and piers with no problems.</p> <p><i>They note that this is a BIG change in standard practice. The commentary should provide direction and directly address their concerns.</i></p>	<p>Sub A is aware of this issue. It is being addressed in CA104. This would be a Code change that Sub A is planning to accomplish this cycle.</p> <p>Negative withdrawn by email 10 Jul 12</p>
54.	Wood	CR055	272	C	5.3.3 should be 5.3.3.1.	Make the change.
55.	Gustafson	CR055	281	C	Consider deleting "all".	This comment apparently refers to Line 291. Agree that the word "all" should be deleted in this line.
56.	French	CR055	285	C	"it" is not needed as in ACI 318-11	No change proposed. The "it" refers to the cement type. Also add "ASTM" before C1157. The sentence would then read: "The appropriate types under ASTM C595 ^{5.7} are IP(MS) and IS(<70)(MS) and under ASTM C1157 ^{5.8} it is Type MS."
57.	Frosch	CR055	297	C	<p>The word "alternative allows" is confusing here since an alternative hasn't been discussed in the table. Suggest rewording as follows:</p> <p>"For Exposure Class S3, the use of Type V plus pozzolan, slag cement, or blended cement, based on records of successful service, is allowed. Alternately, the testing requirements of 5.3.4 may be met.</p>	<p>The footnote in Table 5.3.2 discusses the alternative based on service record.</p> <p>Note that there is an error in Line 256: The reference should be to 5.3.4.1.</p>
58.	Jirsa	CR055	301	C	Suggest rewording "Seawater is listed under Exposure Class S1 (moderate exposure) in Table 5.3.1, "	Make the change.
59.	Frosch	CR055	303	N	Where is it in the Code that other types of cement are	Nonpersuasive. For Exposure Class S1, a

					allowed with the reduction in w/cm?	footnote to Table 5.3.2 provides for different cement types with higher C ₃ A when w/cm is reduced to 0.40. Negative withdrawn by email 5 Oct 12. Recommends adding; "...as footnoted in the Code ..." to ensure this is not missed.
60.	French	CR055	304	C	Consider changing "reduced" to "limited"	See response to Frosch Comment 59.
61.	Becker	CR055	307	C	Just a comment that it seems odd to list air entrainment as "essential" yet there is no requirement for minimum air.	This is ACI 318-11 Code Commentary language. Sub A agrees that the words "adequate air entrainment" should be deleted.
62.	Frosch	CR055	307	C	Is there a requirement for air entrainment in the Code? It seems that the commentary is stating that air is needed, but no guidance is provided.	This is ACI 318-11 Code Commentary language. However, Sub A agrees that the words "adequate air entrainment" should be deleted.
63.	Frosch	CR055	312	N	We have a problem here. This ties with my comment on line 230. In reading the Code (Section 5.3.1), there is no understanding that P1 is the exposure class if no other exposure conditions apply. This is either a problem with the commentary or the Code.	Persuasive See response to Frosch Comment 44 on Line 230. In this instance (Line 312) there does not appear to be a conflict. The wording of Lines 311-313 is intended to indicate that two conditions must apply for P1 to be invoked. The first is the requirement for low permeability when exposed to water. The second is that no other exposure category governs. This is consistent with the Code. However, to ensure there is no confusion, it is proposed to delete the phrase "...and where the other exposure conditions defined in Table 5.3.1 do not apply" on Line 312 as we indicate elsewhere that the most restrictive exposure condition governs as an editorial change. See

						response to Frosch Comment 50 (Line 262). Negative withdrawn by email 5 Oct 12.
64.	French	CR055	315	C	Why omit from this section: "One standard method that provides a performance-based indicator of low permeability of concrete is ASTM C1202, which is more reliable in laboratory evaluations than for field-based acceptance."	This sentence is omitted because it is redundant with Line 162.
65.	Anderson	CR055	319	C	Sentence is awkward because chlorides may not be directly applied. Suggest: "Conditions should be evaluated in structures exposed to chlorides where chlorides may be applied should be evaluated , such as in parking structures where chlorides may be tracked in by vehicles, or in structures near seawater.	Make the change as follows: "Conditions should be evaluated for structures exposed to chlorides..."
66.	French	CR055	321	N	There are other types of reinforcement, see 6.11.2 (zinc-coated (galvanized), epoxy-coated, or <u>zinc and epoxy dual-coated</u>) as well as stainless steel that is not mentioned here.	Persuasive. Editorial change to read "Coated reinforcement, corrosion-resistant steel reinforcement, and cover greater than the minimum required in 6.11.5 can provide additional protection under such conditions." Negative withdrawn by email 7 Oct 12
67.	Frosch	CR055	321	C	Reword to "epoxy-coated or zinc-coated (galvanized)" as done elsewhere in the code.	See response to French Negative 66 on Line 321.
68.	Gustafson	CR055	321	N	Replace the sentence: ". . . Epoxy- or zinc-coated bars. . ." with ". . . Epoxy-coated, zinc-coated (galvanized), or zinc and epoxy dual-coated bars. . .". Should also consider including the other types of corrosion-resistant reinforcement, viz., epoxy-coated wire and welded wire reinforcement, zinc-coated (galvanized) welded wire reinforcement, stainless steel [reinforcing] bars, and stainless steel wire and welded wire reinforcement.	Persuasive. See response to French Negative 66 on Line 321. Email sent 5 Oct 12
69.	Wyllie	CR055	321	C	Suggest changing "or" to "and/or". May be appropriate	See response to French Negative 66 on

					to do both.	Line 321.
70.	French	CR055	329	C	<p>Why change the heading from “Exposure Classes C0, C1, and C2: “</p> <p>Also, it seems that this section should precede line 317 which discusses a subset (Class C2)</p>	<p>Sub A prefers the present location. The heading change was to highlight that the discussion is focused on chloride limits for the corrosion exposure classes. This is a “subset” of other measures for protection against corrosion.</p> <p>No change is proposed.</p>
71.	Frosch	CR055	329	C	<p>Similar to the other subdivisions in this commentary, suggest titling this as “Exposure Classes C0, C1, and C2” and moving this directly after the section on “Exposure Class P1”.</p> <p>Then move the section on line 317 to directly follow this section ending on line 352.</p>	<p>Sub A prefers the present location. The heading change was to highlight that the discussion is focused on chloride limits for the corrosion exposure classes. This is a “subset” of other measures for protection against corrosion.</p> <p>No change is proposed.</p>
72.	Gustafson	CR055	336	C	Replace “reinforcing steel” with “steel reinforcement”.	Global change.
73.	French	CR055	349	C	“1.00” has too many significant figures. Change to “1” as in ACI 318-11.	The limit is 1.00%. ACI 318-11 needs to be corrected.
74.	French	CR055	352	C	What happened to this part of the commentary in ACI 318-11:	<p>Sub A believes that this type of Commentary language is inappropriate because:</p> <ol style="list-style-type: none"> 1. Given that the limits are not in agreement with ACI 318 provisions, Table R4.3.1 places the LDP in an untenable position. The Code is not the place to try to resolve technical differences between ACI Committees. If the ACI 222 (and ACI 201) recommendations are considered appropriate, they should be adopted by ACI 318. See also

					<p>Table R4.3.1 — Chloride limits for new construction (adapted from Table 3.1 of ACI 222R^{4.7})</p> <table border="1"> <thead> <tr> <th rowspan="4">Construction type and condition</th> <th colspan="3">Chloride limit, percent by mass</th> </tr> <tr> <th colspan="3">Test method</th> </tr> <tr> <th>Acid soluble</th> <th colspan="2">Water soluble</th> </tr> <tr> <th>ASTM C1152</th> <th>ASTM C1218</th> <th>Soxhlet*</th> </tr> </thead> <tbody> <tr> <td>Prestressed concrete</td> <td>0.08</td> <td>0.06</td> <td>0.06</td> </tr> <tr> <td>Reinforced concrete wet in service</td> <td>0.10</td> <td>0.08</td> <td>0.08</td> </tr> <tr> <td>Reinforced concrete dry in service</td> <td>0.20</td> <td>0.15</td> <td>0.15</td> </tr> </tbody> </table> <p>*The Soxhlet test method is described in ACI 222.1.^{4.8}</p> <p>In Table 4.2.1, Exposure Classes C1 and C0 are similar to the categories for reinforced concrete under wet and dry conditions in service as described in ACI 222R. The recommended limit for prestressed concrete in this Code is same as in ACI 222R.</p> <p>When epoxy- or zinc-coated bars are used, the limits in Table 4.3.1 may be more restrictive than necessary.</p>	Construction type and condition	Chloride limit, percent by mass			Test method			Acid soluble	Water soluble		ASTM C1152	ASTM C1218	Soxhlet*	Prestressed concrete	0.08	0.06	0.06	Reinforced concrete wet in service	0.10	0.08	0.08	Reinforced concrete dry in service	0.20	0.15	0.15	<p>French Comment 82 on Line 413.</p> <p>2. The statement on coated bars takes exception to provisions of the Code. What do we expect the LDP to do with this information?</p>
Construction type and condition	Chloride limit, percent by mass																														
	Test method																														
	Acid soluble	Water soluble																													
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Reinforced concrete dry in service	0.20	0.15	0.15																												
75.	Anderson	CR055	370	C	<p>Are the air contents required (absolute) or target (try to get there)? Table 5.3.3.1 lists target air contents. Suggest:</p> <p>R5.3.3.1 — A table of required target air contents for concrete to resist . .</p>	<p>Make the change as follows. Delete the word “required” with no replacement so the provision reads “A table of air contents for concrete to resist...”</p>																									
76.	Rogowsky	CR055	372	C	<p>I am not sure what Sub A will do with this comment but it would be useful to inform the code users that air entrainment does not protect concrete from freeze-thaw damage when the degree of saturation is high. Air entrainment only works if the air voids are empty (or mostly empty) when the concrete freezes. Drawing attention to poor coarse aggregate is OK, but it misses the point that air entrainment will not protect any concrete if it is saturated regardless of how good the aggregate is. I believe that in Neville’s book “Properties of Concrete”, he has a figure which shows air</p>	<p>Sub A is working on Code Change Item CA104 that includes revisions to the Commentary on freeze-thaw resistance. These revisions address the issue of critical saturation that is noted in this comment.</p>																									

					entrainment does not protect concrete against freeze-thaw damage if the degree of saturation is greater than about 85%.	
77.	Dolan	CR055	376	C	Delete "will"	Make the change.
78.	Dolan	CR055	389	C	Replace () with commas.	No change is proposed.
79.	Parra	CR055	389	C	Is the last sentence needed?	Yes. Sub A believes that this point needs to be emphasized.
80.	Dolan	CR055	410	C	Delete "Optional designation MS" as it is not used in the code. Similarly on line 411.	The designations are part of the cementitious materials standards and are used in Table 5.3.2
81.	Frosch	CR055	412	C	For new business, can it be provided where the expansion criteria for Exposure Class S3 comes from similar to that done for the S1 and S2.	The expansion criteria are given in ACI 201.2R as referenced in Lines 407-408. The last sentences are pointing out that, for Exposure Classes S1 and S2, the criteria in ACI 201 are the same as ASTM C595 and C1157.
82.	French	CR055	413	C	An addition was made to the commentary in ACI 318-11. Why isn't it included in ACI 318-14: <div style="border-left: 1px solid black; padding-left: 5px; margin-left: 20px;"> ACI 222R^{4.7} has adopted chloride limits, test methods, and construction types and conditions that are slightly different from those in ACI 318, as shown in Table R4.3.1. ACI 201.2R^{4.6} has adopted these same limits by referring to ACI 222R. </div>	Note that this paragraph was not an addition to ACI 318-11. Rather it was improperly located in the first printing of ACI 318-11, apparently during final layout. It refers to Table R4.3.1 and was included in the Commentary for that Table in Codes prior to ACI 318-11. Sub A believes this paragraph is inappropriate for the reasons stated in the response to French Comment 74 for Line 352. Therefore it is proposed for deletion.
83.	French	CR055	419	C	Please note, I did not go through and check the references. Suggest that staff review that appropriate references are retained and formatted consistently in ACI 318-11.	Staff editorial
84.	Wyllie	CR055	419	N	ASTM references should not be included in the reference list. They are include in the new 3.8	Persuasive. Per discussion at the ACI 318 meeting on

						June 15, 2012, the references cited in the Code will be identified separately to assist the staff.
<p>The following Comments are from A05-2012 [NOTE: Line numbers in A05-2012/A07-2012 differ from those in LB12-4. The numbers in parentheses below are the equivalent line numbers from LB12-4. These comments have been resolved as decided in A07.</p>						
1.	Carino	A05	50 (51)	C	The words "this strength level" are ambiguous. Suggested revision: "When concrete is proportioned to achieve a strength level greater than the specified strength, it ensures that the concrete strength tests will have a high probability of meeting the strength acceptance criteria in 22.5."	Make the change.
2.	Carino	A05	54 (55)	C	Avoid "design strength" when referring to concrete strength. Use "specified strength."	Make the change.
3.	Carino	A05	78 (79)	C	Should we add a sentence to this paragraph stating that Eq. 5.2.2.1.b is based on Eq. 5.2.2.1.a for a concrete density of 144 lb/ft ³ .	Suggest no change. It is clear that 5.2.2.1.b is based on normalweight concrete. As New Business the equations in 5.2.2.1 should be reviewed and updated.
4.	Gleich	A05	83 (84)	C	The 80% could be lowered to 60% based on history from my Greenville Plant.	No change.
5.	Carino	A05	131 (133)	N	I think the commentary is misleading. I don't see how the mention of splitting tensile strength tests as an alternative method for estimating lambda could be construed that splitting tensile strength test might be used for acceptance testing. I don't know the intent of "indirect control". I think this portion of the Commentary should be rewritten starting with a blank page. For new business the Code provision should be	Persuasive. Recommend that Section 5.2.4.3 and corresponding Commentary be deleted as part of CA116. This would be a code change. See response to Frosch Comment 18 (Line 130) on LB12-4.

					<p>deleted because it is clear that the code only addresses acceptance based on compressive strength. This may a holdover from earlier versions of the Code that said the splitting tensile strength had to be specified (see 318-71, 11.3.1):</p> <p>value of $f_{ct}/6.7$ used shall not exceed $\sqrt{f'_c}$.</p> <p>value of f_{ct} shall be specified and the concrete shall be proportioned in accordance with Section 4.2.</p>	
6.	Carino	A05	157 (159)	C	<p>"these characteristics" is vague. Suggested revision:</p> <p>"Use of fly ash, slag cement and silica fume will increase concrete's resistance to fluid penetration at the same w/cm compared with concrete made with portland cement only."</p>	See response to Kopczynski Comment 21 (Line on LB12-4.
7.	Carino	A05	159 (162)	C	<p>I'm not sure the reader will understand the intent of "performance-based." Suggested revision:</p> <p>ASTM C1202^{5.5} provides an indirect method for comparing the resistance to fluid penetration of alternative concrete mixtures."</p>	No change. Will they understand "indirect method"?
8.	Carino	A05	162 (165)	C	<p>The wording can be made more precise:</p> <p>"Because it is difficult to verify accurately the w/cm of concrete, the selected value of f'_c should be consistent with the maximum w/cm permitted for durability. Selection of an f'_c value that is consistent with the maximum permitted w/cm for durability will permit results of strength tests to be used as a surrogate for w/cm, and thus help ensure that the maximum w/cm is not exceeded in the field. For example, a maximum w/cm of 0.45 and f'_c of 3000 psi should not be specified for the same concrete mixture. Instead, specify an f'_c of 4500 psi if the maximum w/cm is 0.45."</p>	<p>Change to read:</p> <p>"Because it is difficult to verify accurately the w/cm of concrete, the selected value of f'_c should be consistent with the maximum w/cm permitted for durability. Selection of an f'_c value that is consistent with the maximum permitted w/cm for durability will permit results of strength tests to be used as a surrogate for w/cm, and thus help ensure that the maximum w/cm is not exceeded in the field. For example, a maximum w/cm of 0.45 and f'_c of 3000 psi should not</p>

						be specified for the same concrete mixture. In this case f'_c should be specified at 4500 psi or greater to be consistent with the maximum specified w/cm. See Table 5.3.2.” Also see response to Wyllie Comment 34 (Line 170) on LB12-4.
9.	Carino	A05	171 (174)	C	Suggestions for improvement: "Therefore, the requirement for a minimum value of f'_c is used to ensure a high-quality cement paste."	Make the change.
10.	Carino	A05	172 (175)	C	I wonder if this last sentence really helps. I think the dual requirement for f'_c and w/cm is probably one of the biggest creators of job disputes.	Delete the sentence.
11.	Carino	A05	205 (208)	C	Add "Exposure" in front of "Class F1."	Make the change.
12.	Carino	A05	268 (272)	C	Change "should be air entrained" to "is to be". We cannot use the Commentary to change a requirement to an option.	Make the change.
13.	Hooton	A05	273 (277)	N	Page 10, line 273-274 reads: Exposure Classes S1, S2, and S3: Concrete exposed to injurious concentrations of sulfates from soil and water should be made with sulfate-resisting cement. Table 5.3.2 lists the appropriate types of cement and the maximum w/cm and minimum specified compressive strengths for various exposure conditions. The first sentence only communicates one of the 3 requirements. Suggest modifying the first sentence to read, Exposure Classes S1, S2, and S3: Concrete	Persuasive. Delete the first sentence. Change the second sentence to: "Table 5.3.2 lists the appropriate types of cement and the maximum w/cm and minimum specified compressive strengths for various sulfate exposure conditions." Editorial change See also Wood Comment 48 on Line 262.

					<p>exposed to injurious concentrations of sulfates from soil and water should be made with sulfate-resisting cement in concrete meeting also minimum strength and maximum limits on w/cm.</p> <p>alternately, the first 2 sentences could be combined.</p>	
14.	Carino	A05	274 (278)	C	Change "should be air entrained" to "is to be". We cannot use the Commentary to change a requirement to an option.	No reference to air entrainment on Line 274 (278). However, the sentence has been proposed for deletion. See response to Hooton Negative No. 13, Line 273 (277).
15.	Carino	A05	298 (302)	C	I suggest using "of soluble sulfate" instead of "SO ₄ " because the latter is not used in the commentary.	No change. SO ₄ is used in Table 5.3.1.
16.	Carino	A05	303 (307)	C	I question the use of "adequate air entrainment." Is there a Code requirement for entrained air for Exposure Category S?	The words "adequate air entrainment" have been proposed for deletion. See response to Becker and Frosch Comments 61 and 62 on Line 307.
17.	Carino	A05	310 (314)	C	As written, there is an implication that choice of cementitious materials can be used to bypass the w/cm requirement. I suggest this be revised: "For a given w/cm, permeability can be reduced by optimizing the cementitious materials used in the concrete mixture."	Make the change.
18.	Carino	A05	329 (333)	C	Should this be "mass" rather than "weight?" Steering committee needs to address this issue. Note that we use "mass" in Table 5.3.1.	Global editorial.
19.	Carino	A05	346 (350)	N	Delete the last sentence. It's just a restatement of the Code and does not provide any explanation.	Persuasive. Make the change. See also Wood Comment 48.
20.	Carino	A05	369 (373)	N	We should provide additional guidance. "Such aggregates can be evaluated for resistance to	Nonpersuasive. These are not Code requirements.

					<p>freezing and thawing by using ASTM C1646/C1646M in conjunction with ASTM C666/C666M."</p> <p>Add to references: ASTM C666 / C666M - 03(2008) Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing ASTM C1646 / C1646M - 08a Standard Practice for Making and Curing Test Specimens for Evaluating Resistance of Coarse Aggregate to Freezing and Thawing in Air-Entrained Concrete</p>	
21	Carino	CA 116 A05		C	<p>Should we define it as "measured average compressive strength of lightweight concrete." That is in fact what it is when Eq. 5.2.4.2 is used.</p>	This comment transferred to CA 116 for resolution.

SUMMARY OF SUB A ITEMS -- BEFORE TORONTO MEETING

	Total Sub A items	51	
	Last CA Number Assigned	CA 117	
SOURCES	Carryover from 2008 Code cycle	16	
	Added from public 2008 comments	11	
	Added during this Code cycle	24	
	Total	51	
RESOLVED	Adopted, 2011 Code	6	
	Not adopted, 2011/2014 Code	24	
	Adopted, 2014 Code	2	
	Active items	19	
	Total	51	

ACTIVE ITEMS

NUMBER	DESCRIPTION	RESPONSIBLE	COMMENTS
CA 002	Curing issues, 5.6.4.1 and 5.11. New Chapter 22	Hover	25 Mar 12, email to Hover regarding future of this item.
CA 056	Harmonize chloride limits. New Chapter 5	Weiss	On hold, coordinate with ACI 201 and ACI 222
CA 065	Maximum size of aggregate between reinf and forms. New 22.3.2.1	Holland, CH 22 TG	Passed Sub A. To CH 22 TG to consider.
CA 069	Incorporate certified inspectors into the Code. New Chapter 22.	Holland and Carino	Sub A ballot 10-2006, DNP. Holland to update and ballot.
CA 070	Cementitious materials for chlorides. New Chapter 5.	Lobo/Weiss	On hold, coordinate with ACI 201 and ACI 222
CA 077	Rewrite Ch 5, construction issues. New Chapter 23.	Hover	Sub A ballot A01-2009, DNP, revise and rebalot. Will be addressed once CH 23 is available.
CA 088	2008 Code, PC 38, Gustafson 318 ballot comment. Table R.4.3.1, second sentence below table. Delete sentence regarding epoxy and zinc coated bars. New Chapter 5.	Hooton, CH 5 TG	Was on Sub A A04-2011, did not pass Sub A. To CH 5 TG to consider.
CA 092	2008 Code, PC 69, Cunningham. 2.2 and 5.6.2.4, add definition of strength test to Ch. 2. New Chapters 2 and 22.	Carino	Passed Sub A -- 14 Oct 11 -- to Ch 22 TG for inclusion in new business
CA 093	2008 Code, PC 414, Green. R8.6.1, give justification for interpolation in values of lamda. New Chapter 5.	Bondy/Meyer, CH 5 TG	Passed Sub A. To CH 5 TG to consider.
CA 099	Clarify use of term f'c, various locations. New Chapter 22.	Fiorato	Passed Sub A -- 14 Oct 11 -- to Ch 22 TG for inclusion in new business
CA 101	Clarify requirements regarding measuring air. New Chapter 5.	Hover, CH 5 TG	Passed Sub A. To CH 5 TG to consider.

CA 103	Add "and roofs" to 6.4.4 (misc Item #3) New Holland Chapter 23		Passed Sub A. Will be addressed once CH 23 is available.
CA 104	Remove Exposure Cat. "Permeability" from Ch. 4; misc edits to Ch. 4 (misc item # 4); includes clarification of Cats C and F. New Chapter 5.	Lobo/Hooton	On Sub A ballot A06-2011, did not pass. Discuss in Cincy
CA 105	Number of 4x8 inch cylinders required. New Chapter 22.	Kosmatka	Assigned at San Antonio meeting. Waiting on additional documentation
CA 111	Additional lamda issues -- can lamda be defined on basis of unit weight? New chapter 5 and elsewhere.	Meyer	Assigned in Pittsburgh. Meyer is working on this.
CA 113	Combination of several definitions. Various locations.	CH 5 TG. CH 22 TG	All have passed Sub A. To CH 5 and CH 22 TG to consider
CA 115	Editorial changes, Chapter 5 Code	Holland	Passed Sub A. 318 LB 12-4. To be wrapped up in Toronto
CA 116	Fix Lambda calculation, Chapter 5 Code	Holland	Passed Sub A. 318 LB 12-4. To be wrapped up in Toronto
CA 117	Review whether to add C1600 cements to Code	Weiss	List of additional information required returned to propont for this change. Returned Sep 12.

Sorted Comments for ACI 318 Ballot LB12-7 AND Sub A Ballot A09-2012

As of September 5, 2012

Com#	Last Name	Line #	Vote	Tag	Comments	Response
3	Becker	0	C	E	It seems contrary to other chapters to have so many lists with letters or lower case roman numerals. Should these have provision numbers?	
9	Jirsa	0	C	E	General question—In some sections the wording is “Construction documents shall specify” and in other “Construction documents shall indicate” (include?) Is a construction document a specification?	
12	Kopczynski	1	C	E	Title is awkward with “and” used twice	
13	Novak	1	N	E	The proposed title is confusing (especially with the double ‘and’) and does not convey the essence of the boxed note or the intended scope of the chapter (section 23.1). To comply with the intent of Lines 6 to 12 of the boxed note and the scope of the chapter, the title of the chapter could be reworded as: Chapter 23 – Construction Requirements to be Incorporated into the Construction Documents and Inspections	
14	Rabbat	1	C	E	I assume that construction documents cover construction requirements. No need to repeat the latter. Revise the title to: Construction Documents and Inspection Requirements	
15	Corley	2	N	E	Grammar is wrong. Title should be “Construction Documents and Inspection Requirements”. Note that the word “Requirements” is redundant. The entire code is “Requirements”. It would be enough to say “Construction and Inspection”.	
21	Alcocer	62	N	E	It may be a naïve comment, but I wonder where “constructions documents” are defined. Do we implicitly know what they mean? In 23.7.1, construction documents are interchangeable with shop drawings. I thought shop drawings were part of construction documents. I suggest to include a definition of “construction documents”.	
24	Carino	63	C	E	Are we going to use “shall apply to” rather “shall govern” to be consistent with what we did in other chapters?	
26	Poston	63	C	E	Suggest striking “required” as it is understood.	
34	Carino	66	N	E	The sentence should be written in the active voice in parallel to the prevision section. “Other provisions of this chapter apply to minimum inspection requirements.” I agree that the second sentence needs to be in the Commentary because it is only providing information.	
35	Jirsa	66	C	E	Move second sentence to Commentary	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
36	Corley	67	C	E	Move to commentary	
37	Fiorato	67	C	E	Agree that sentence related to General Building Code should be in the Commentary.	
38	Gerber	67	C	E	Editorial revision: . . . <i>chapter. The General Building Code may require additional inspections.</i>	
40	Mlakar	67	C	E	Agree with second sentence in commentary.	
41	Novak	67	N	E	Second sentence is clearly commentary and should be reworded as "The governing jurisdiction and/or the general building code may require additional inspections."	
42	Poston	67	C	E	I agree that this sentence belongs in the Commentary.	
43	Sanders	67	C	E	Put in commentary	
44	Wood	67	C	E	I thought that we could not use "may" in the Code. How about "If the General Building Code includes additional inspection requirements, those requirements shall control."	
45	Becker	68	Y	E	I agree with the boxed comment.	
46	Bondy	68	C	E	Agree the second sentence of 23.1.2 belongs in the Commentary.	
47	Cleland	68	C	E	The second sentence should be commentary	
48	French	68	C	E	OK either way.	
49	Frosch	68	C	E	Agreed about the second sentence. Please move to commentary.	
50	Kopczynski	68	C	E	Agreed.	
51	Parra	68	C	E	Agree	
52	Rabbat	68	C	E	Yes, please move second sentence to commentary. Chapter 1 clarifies the relationship between this Code and the General Building Code. If more inspections are needed, the General Building Code governs those inspections.	
53	Schaeffer	68	Y	E	Agree	
54	Seguirant	68	C	E	Agree that the second sentence should be commentary.	
55	Wyllie	68	N	E	The second sentence must remain, as many jurisdictions do have additional inspection requirements.	
56	Carino	70	N	E	See my general comment about the need for an introductory sentence.	
57	Hover	70	C	E	Ken's Comment: It would reduce ambiguity if it were clarified whether the word "code" refers to the ACI 318 Code, the model code, or the local jurisdiction building code. [Also, as a weird complication: Suppose my State Building code requires the 2008 318 code. The 2014 code tells me I have to state the date of the code I am using. What authority does the 2014 code have if I am not using it?]	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
58	Jirsa	70	N	E	To be parallel with next section, it would seem we need "23.2.1 Construction documents shall include (a) and (b):"	
59	Mlakar	70	C	E	Is some text missing before between lines 70 and 71?	
60	Rabbat	70	C	E	A section 23.2.1 is missing. It is needed to clarify what to do with Items on Lines 71-73.	
61	Rogowsky	70	C	E	Information in 23.2 should be on the drawings.	
62	Sanders	70	N	E	There needs to be a transition sentence that explains what is in (a) and (b). Could use the same method as in 23.3.1, "Construction documents shall specify (a) and (b) on code version and information on loads:"	
63	Frosch	71	C	E	A provision is needed to say what is required. Also, 23.2 is just the title. A provision is needed under it. Suggest the following: 23.2.1 – Construction documents shall identify (a) and (b):	
64	Kelly	71	N	E	This section seems to list items to include on the construction documents (preferably the drawings) but I am not sure the format is such that doing so is a requirement. Section 23.1.1 refers to including information on the construction documents, but there is not a directive of what to do with the items listed in Section 23.2 Use "Code" instead of "code" because doesn't a capital "C" refer to ACI 318? As currently written, the requirement could be misinterpreted to mean the General Building Code, which we should not be requiring even though "code" is consistent with ACI 318-11. The commentary could state what the General Building Code typically requires on drawings, but I don't think we should be repeating it in ACI 318.	
65	Parra	71	N	E	I assume items (a) and (b) are intended to be included in the construction documents. Thus, add "Construction documents shall specify (a) and (b)".	
66	Seguirant	71	C	E	Like the subsequent sections, this section should begin: " 23.2.1 – <i>Construction documents shall specify (a) and (b), as applicable:</i> "	
67	Wood	71	N	E	As I user, I don't know what to do when faced with (a) and (b). I suggest that either a general statement (equivalent to 23.3.1) be added to each section to tell the user that (a) through (x) must be specified. Alternatively, 23.1.3 could be added to tell the user how to interpret the lists (a) through (x) in each section. I prefer the first option, but it is redundant.	
68	Wyllie	71	N	E	This makes no sense as a stand alone section. Need language that the CD's shall include... Section 2.3.1.1 is not the lead for this section.	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
69	Anderson	73	C	E	Suggest adding "loads" after live – it seems naked without it. I know it is redundant, but "Live loads and other loads" sounds better.	
70	Becker	73	N	E	Since technical changes are being proposed, why not simplify this to (b) Live and other Loads used in design."	
71	French	73	C	E	Change to " Live and other Loads used in design."	
72	Gustafson	73	C	E	After "Live", insert "load".	
73	Kelly	73	C	E	Since ACI does not specify live loads, I am not sure that this is the correct document to require the inclusion of the live load on the construction documents though I am not opposed to it either since it is such an important item in the design. Perhaps the commentary should state that the General Building Code requires that the live load be included on the drawings.	
74	Poston	73	C	E	Suggest the following language: "Loads used as the basis of design."	
75	Wyllie	73	N	E	Live <u>loads</u> and ...	
76	Dolan	75	C	E	Delete "as applicable. I think it is not necessary either here or in other locations such as line 87.	
77	French	75	C	E	Prefer to reorder the sentence to list the differentiating part of the statement first. In other words, rather than starting with "Construction documents..." Change to: "Concrete member information to be specified in construction documents shall include (a) through (f) as applicable."	
78	Frosch	75	C	E	Please reword as follows to make all of the items in the list below parallel. 23.3.1 – "Construction documents shall specify (a) through (c) and identify (d) and (e) for concrete members, as applicable: Then delete "Identify" in (d) and (e) Alternately, consider moving items (d) and (e) to a new section instead of maintaining all in 23.3.1. 23.3.2 – Construction documents shall identify (a) and (b) for concrete members, as applicable.	
80	Seguirant	75	C	E	The list only goes up to (e).	
81	Wood	75	C	E	The list in 23.3.1 does not include (f). Please revise introductory sentence.	
82	Dolan	77	C	E	The adjective "structural" should be deleted when referring to members. Here and lines 81, 211, 294, 338, 455, 457	
105	Wood	81	C	E	23.3.1 states that the documents shall specify things. Items (a), (b), and (c) are parallel and grammatically consistent with 23.3.1. (d) and	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
					(e) are not.	
118	French	87	C	E	Here and elsewhere. See comment associated with line 75: Prefer to reorder the sentence to list the differentiating part of the statement first. In other words, rather than starting with "Construction documents..." Change to: "Concrete mixture information to be specified in construction documents shall include (a) through (f) as applicable."	
120	Sanders	87	C	E	It would be better to add a new 23.4.1 that takes care of all of the subsection of 23.4 like what is in 23.9.1, "The provisions of 23.4, shall be included in construction documents,"	
121	Anderson	91	C	E	Are we now using the term "ingredients" for the constituent materials in a concrete mix? I cannot get out of my head that ingredients refer to those items we put in a cake recipe. Please consider using the word "constituent."	
122	Becker	91	N	E	I would suggest this is too vague to know what to put in a specification. Suggest "(b) <u>All Requirements or limitations for concrete ingredients for maximum w/cm, air content, cementitious materials, maximum water-soluble chloride ion content, and minimum f'_c for the specified exposure class in accordance with 5.3 and requirements for w/cm of concrete.</u> " I would further suggest that the commentary could use some enhancement to explain why all this information has to be in the construction documents.	
123	Carino	91	C	E	I suggest we insert "permitted maximum" in front of "w/cm."	
124	Fiorato	91	C	E	Is the second occurrence of the word "requirements" needed?	
125	Gerber	91	C	E	Should "ingredients" be changed to "materials"?	
126	Rabbat	91	C	E	Is the purpose of Item (b) to take care of the durability requirements associated with the exposure classes of Item (a)? If so, Item (b) is not needed.	
127	Schaeffer	91	N	E	I think the first part of this provision is too vague; "Requirements or limitations" can cover a lot of different things. Suggest that the provision state " <i>Requirements for w/cm of concrete</i> ".	
128	Seguirant	91	C	E	Shouldn't this be two requirements – one for ingredients and one for w/cm?	
134	Schaeffer	95	C	E	The comma is not needed.	
140	Carino	97	C	E	Unless we have revised the term in Chapter 2, this should be "density" rather than "unit weight."	
144	Carino	98	N	E	See my general comment about the need for an introductory sentence.	
165	Carino	114	C	E	Need a colon and delete "[332]"	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
411	Becker	239	C	E	Add comma after size.	
412	Seguirant	239	C	E	Put a comma after "size". What are "details" of reinforcement?	
413	Wight	239	C	E	Add a comma between "size" and "location".	
414	Wyllie	239	E	E	Comma after size.	
446	Becker	259	C	E	23.4.2(a) should be 23.5.2(a)	
447	French	259	C	E	Delete extra ")" after "(a)"	
448	Sanders	259	C	E	Change from Table 23.4.2 (a) to Table 23.5.2 (b)	
449	Wight	259	C	E	Change 23.4.2 to 23.5.2.	
511	Wood	305	C	E	The use of "they" in (i), (ii), and (iii) seems out of place. Personal pronouns are not common in 318. Please revise (c) to eliminate the use of "they."	
519	Corley	319	C	E	Strike "They should be spaced" and insert "spacing shall be".	
520	Gerber	319	C	E	Usually personal pronouns are avoided. Here is a revision: They shall be spaced <i>Spacing shall be at least three diameters or widths on center.</i>	
526	French	329	C	E	Change to: "Member construction information to be specified in construction documents shall include (a) through (d) as applicable."	
527	French	332	C	E	Fix "reinforcement"	
528	Gustafson	332	C	E	Fix "rein=forcement".	
529	Parra	332	C	E	Remove strange character in "reinforcement".	
572	Corley	360	C	E	Strike first "and" and insert comma.	
573	Frosch	364	C	E	Add comma after "strength"	
593	Corley	400	C	E	Strike "The".	
594	Cleland	402	C	E	Ep should have the "p" as a subscript	
595	Frosch	402	C	E	Fix subscript E_p .	
596	Gustafson	402	C	E	Replace "Ep" with " E_p ".	
597	Wight	402	C	E	Show "p" as a subscript in Ep.	
598	Wood	402	C	E	Ep should be E_p .	
601	Becker	406	C	E	23.8.2.4(a) and (b) should be 23.8.2(d)i and ii.	
602	Carino	406	C	E	Fix the referenced section numbers. I assume they should be 23.8.2(d)i and 23.8.2(d)ii. There are other places in the "notes" where the referenced sections do not agree with the numbering in this version of the chapter.	
603	French	406	C	E	Numbering is in error Change to "23.8.2(d) (i) and (ii)"	
604	Frosch	406	C	E	Insert "The" at start of sentence. Also, correct provision number 23.8.2(a) and (b).	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
606	Sanders	406	C	E	Change 23.8.2.4 (a) and (b) to 23.8.2 (d), (i) and (ii)	
607	Wyllie	406	N	E	Sections 23.8.2.4 (a) and (b) make no sense. 23.8.2 (d) (i) and (ii)?	
608	Frosch	407	C	E	Change “elements” to “construction” to be consistent with line 408.	
609	Gustafson	407	C	E	Replace “elements” with “members”. The term “members” is used in Line 414.	
610	Gustafson	408	C	E	Replace “construction” with “members”. The term “members” is used in Line 419.	
639	Carino	445	C	E	Remove capital letter on “shores”.	
648	Seguirant	465	C	E	Insert <6.1.5> after the provision.	
665	Dolan	488	C	E	This provision is no longer in Chapter 1 so it is not a repeat.	
666	Frosch	488	C	E	Agree that this belongs here and not in chapter 1.	
684	Gustafson	515	C	E	Capitalize “general building code”, i.e., “ <u>General Building Code</u> ”.	
706	Seguirant	537	C	E	Chapter 17 should be Chapter 20.	
707	Wood	537	C	E	Chapter 17 addresses joints and connections – not seismic design provisions.	
708	Wyllie	537	N	E	Chapter 20 at last look. Maintain seismic also.	
709	Frosch	539	C	E	Consider changing “made” to “performed”	
710	Sanders	539	N	E	Add “The LDS shall specify that the inspector...”	
1	Anderson	0	C	P	As a general comment, it is oftentimes not clear to me who is the audience for this chapter. Is it the LDP, the contractor, the contractor’s engineer, the building official, none, all, some combination? We started with some clear verbiage saying “construction documents shall specify . . .” but we seemed to get away from that introductory verbiage fairly quickly (Section 23.4.2) and then picked it up again in Section 23.5.1. I think it may add more verbose, but we need to be more clear in every section as to the “construction documents shall specify . . .” Or, we are addressing the LDP directly. Or, the LDP shall ensure the Contractor understands . . . I appreciate Sub Gs contributions to format, but the audience for this chapter or who we are speaking to remains very confusing.	
2	Becker	0	C	P	Based on informal communications and the notes introducing this chapter, it has become clear that the 318 philosophy is that the contractor has no responsibility to comply with the requirements of 318. Chapter 23 then contains provisions that the LDP has to incorporate in the construction documents. I have two general concerns. The first is that many provisions are not written in such a way that they can be easily written into a specification or easily interpreted for the action	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
					required of the contractor if written into the specification. I am not sure that 318, as previously developed, considered that the provisions would be used in this way. I suggest that we must be very careful to not only ensure technical accuracy, but now also consider specification and contract implications of any particular provision. My second general concern is that we have many sections that state something like "Construction documents shall specify a to z." Those provisions are then followed by construction related items that, based on the premise of the chapter, also have to be somehow included in the construction documents. Are we creating confusion by having specific lists clearly required in the construction documents followed by other stuff not explicitly required in the construction documents? My bottom line is I am not sure the intent of the chapter is consistent with the verbiage of the chapter.	
4	Carino	0	N	P	Scope section 23.1.1 states that the provisions of this chapter are to be included in the construction documents. Then, sections such as 23.3.1 begin with: "Construction documents shall specify..." But some sections like 23.2 do not have such a statement. While it may be redundant, I think each section should begin with "Construction documents shall specify..." This will make the sections consistent and help reinforce that these provisions need to be transferred to construction documents.	
5	Dolan	0	N	P	<p>This chapter seems to contain three types of information and they are not clearly separated. First, the chapter lists the information that the LDP is required to include on the construction documents. Second, the chapter identifies information that the contractor is to provide to the LDP. Third, the chapter provides specifications for construction of concrete structures.</p> <p>My recommendation is to restructure the chapter so the three tasks are clearly delineated. For example, have LDP requirements first, followed by Contractor requirements for submittals to the LDP, then include Concrete Specifications. Alternatively have a parallel structure in each grouping that follows the same logic. I think this is what was intended, but the sections get intermingled. I realize that there are a few locations where this becomes difficult, e.g., shop drawing specification of release strength.</p>	
6	Fiorato	0	C	P	The overall structure and wording of sentences in this chapter lacks "parallelism". We seem to be mixing provisions for a list of items that must be in the construction documents with sections on specific Code requirements. Suggest we first agree on the purpose of the chapter and the specific requirements, and then do a major edit	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
					for consistency of wording.	
7	Frosch	0	N	P	<p>This is a general comment about the presentation of the material. I really like that all of the construction related requirements are gathered in one place. It makes it much easier to locate this information and will be very useful. My negative is regarding the following.</p> <ol style="list-style-type: none"> 1. As one goes through the chapter, it is inconsistent in presentation. More importantly, it is not clear what is required to be done with many of the items. For instance 23.2 doesn't say what is done. However, 23.3.1 indicates that the CDs must specify this information. There needs to be consistency throughout the chapter. 2. Perhaps a general section is needed to explain how to use this chapter. It is not clear as currently presented. 3. In looking over the chapter, there seems to be two general topics: <ol style="list-style-type: none"> 1) Material that needs to be indicated on the drawings. 2) Material that needs to be included in the specifications. <p>Maybe this distinction can be made clearer by spelling it out. For instance 23.4.1 is material that needs to be specified. However, the rest of the section 23.4.2 through 23.4.8 (in general) appears to be material that is needed to be addressed in the specifications. (I say in general because 23.4.7(a) has information that should be indicated on the drawings. It seems that it would be much clearer if the items to be specified for each topic were grouped together at the front of the section. Here is an example layout for 23.4</p> <p>23.4 – Concrete</p> <p>23.4.1 – Items to be specified on drawings</p> <p>23.4.2 – Items to be addressed in the specifications</p> <p style="padding-left: 40px;">23.4.2.1 – Production and delivery</p> <p style="padding-left: 40px;">23.4.2.2 – Placement and consolidation</p> <p style="padding-left: 40px;">23.4.2.3 – Curing</p> <p style="padding-left: 40px;">23.4.2.4 – Cold weather</p> <p style="padding-left: 40px;">23.4.2.5 – Hot weather</p> <p>I didn't include the other sections as it seems that 23.4.7 (Construction Joints) and 23.4.8 (Construction of members) would fit better as part of 23.3 (Member information).</p> <p>I believe a similar format is needed for the other main sections.</p>	
8	Ghosh	0	N	P	I completely agree with the statement: "The	

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					<p>Committee needs to resolve the issue of whether all of the provisions in Chapter 23 are required to be included in the construction documents. If not, the requirements in Section 1.8.1 will need to be modified because a conflict currently exists." It seems to me that in the course of reorganizing we are proposing fundamental changes in the scope of the ACI 318 document. If I understand correctly, we are now being told that the contractor need not even read ACI 318. It is apparently the LDP's responsibility to tell the contractor in the construction documents what he or she needs to know. This appears to me to be a rather fundamental change from what some of us understood the scope to be. Let's have a discussion before this chapter is given its final shape.</p>	
10	Schaeffer	0	N	P	<p>This Chapter has greatly increased the requirements that the LDP has to include in the Construction Documents and I am philosophically opposed to adding these new requirements. I think this is placing more of a burden on the LDP who continually has to cope with increasingly complicated codes every several years, BIM, reduced responsibility of other members of the construction team, etc.</p> <p>Every section begins with the provision and the statement "as applicable", which seems to be too vague; in a lot of the cases what is "applicable" is not well defined. If these are requirements of what has to be included in the CDs what is applicable and what is not may be easily debated.</p> <p>With all of these new requirements to be included in the documents most engineers will simply add a note to their General Notes that states that "all construction shall meet the requirements of ACI 318 Chapter 23".</p> <p>Most CD's already reference ACI 301 which contains a lot of what is contained in this Chapter so there appears to be a lot of overlap. Possibly this Chapter could be simplified by stating that ACI 301 Specifications shall be included by reference in the CDs and then require the LDP to include in the CDs anything that deviates from 301.</p>	
11	Taylor	0	N	P	<p>I am voting "no" because I believe the 318 committee as a whole needs to make some fundamental decisions about this chapter before it moves forward. Historically there have been many provisions in ACI 318 that are instructions to the contractor only, and are completely beyond the control of the engineer. I believe that almost none of these construction-related requirements should appear in the ACI 318 code; instead, the vast majority of construction-related requirements, should be incorporated in ACI 301. ACI 301 is the proper place for</p>	

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					instructions to contractors. If this were done, then Chapter 23 would be quite short. It would essentially specify items that the engineer is required to list on the structural "General Notes" sheet. I would change my vote to "Yes" if Sub A, B, and G were to first review this chapter with the objective of splitting out all requirements that are clearly instructions to the contractor only, not the engineer. Then the ACI 318 committee could review and vote on a much more streamlined chapter, which is directed exclusively at requirements for the engineer.	
16	Bondy	21	C	P	I see problems with the statement in Lines 21-24. First, everything in Chapter 23 is an instruction to contractors that may or may not be included in construction documents depending on whether it applies to the project (see 23.1.1). The LDP is responsible for determining which of all these construction requirements collected in Chapter 23 is applicable to the project, and if it is, the general building code requires that it be included in the construction documents (see IBC 106.1.1). There is no need to isolate some of these requirements as "construction requirements" and imply that they need not be included in construction documents if they do in fact apply to the project. If they apply to the project, and they are important enough to appear in the Code, they MUST be included in the construction documents, as stated in the general building code. The concept expressed in Lines 21-24 can lead only to confusion. I have reflected this in my voting below. Finally, while Roger did recommend this format change (see Line 21) in negative votes in his ballot on LB12G-1 the change was never resolved and approved by the full subcommittee.	
17	Poston	23	C	P	This is supposed to be an instruction to the LDP – I think. There should be language up front in this chapter, probably in the Commentary that provides makes it clear to the LDP that he/she is to do include the information in the construction documents.	
18	Carino	24	N	P	The Code cannot provide a "list" of instructions to the contractor because the Code is written to the LDP. Any requirements of the contractor need to be written explicitly in the construction documents. So the lists need to be preceded with the words that the LDP will place the requirements in construction documents.	
19	Wood	25	C	P	I agree that the conflict with 1.8.1 needs to be resolved. 1.8.1 implies that Chapter 23 lists mandatory and optional information, much like the specifications checklists. This does not seem to be the case.	
20	Wyllie	25	N	P	I frankly believe we are going the wrong way with this chapter. The old 1.2.1 list of items to be included in the construction documents was concise and all was together. This chapter has	

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					those items scattered in various sections amid construction requirements.	
22	Becker	63	N	P	If the instruction is that 318 is written only to the LDP, this provision should be more direct. Suggest "23.1.1 – The provisions of this chapter shall govern information required to be included in the construction documents, as applicable, for use by to define requirements for the contractor or and building official.	
23	Becker	63	C	P	I would suggest that it is not common knowledge that the contractor has no responsibility for 318 provisions. The commentary should be used to explain this. Suggest something like "The construction documents must completely describe requirements that are necessary for the work to comply with the code. The contractor will rely only on the construction documents to describe the work and will not have a responsibility to understand, interpret, or comply with code requirements that are not specifically in the construction documents. Do not simply specify 318-14 as a reference document. Other ACI specifications such as 301-10 or 423.7 may be referenced as long as information specific to the project as instructed for those documents is also included in the construction documents."	
25	Kelly	63	N	P	The remaining sections just list items; for example, 2.3.2 (b) lists name and date of issue of code..., but 23.2 (b) does not state what to do with it. Therefore Section 23.1.1 needs to state something to the effect of: "Sections 23.2 through 23.9 list items that shall be included in the construction documents if applicable." Alternatively, sections such as 23.2 should be structured similar to 23.3.1, which specifically states that the items that follow are to be included in the construction documents. As currently written, this chapter is unclear as to what it requires and who the audience is. The note at the start says that this chapter is intended to include items that the LDP should consider requiring in the contract documents, but the chapter is not written in a manner that conveys this.	
28	Schaeffer	63	C	P	I don't think the second part of the sentence is necessary. I suggest " <i>The provisions of this chapter shall govern information required to be included in the construction documents.</i> "	
29	Seguirant	63	C	P	I think that requiring the LDP to include all current construction requirements in the construction documents is a huge substantive change that can't possibly be properly vetted during reorganization. I suggest a separate chapter on construction requirements that are not currently required to be shown in contract documents. I am not voting No because I am not an LDP that assembles construction	

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					documents, but I will support those that do.	
30	Wood	63	C	P	Suggest revising as "This chapter defines the information that must be included in the construction documents ..." The current wording is extremely awkward.	
31	Wyllie	63	N	P	The focus should be on the construction requirements for concrete construction plus information required on the CDs to direct the construction. The almost complete editing of existing provisions has made many technical and significant changes in intent.	
32	Kelly	64	C	P	"...for use by the contractor, <u>owner</u> , or building official." I suggest adding owner because the owner often retains the testing agency.	
33	Becker	66	N	P	This should be more specific. Suggest "23.1.2 – Minimum inspection requirements of 23.10 shall be governed by the provisions of this chapter <u>specified.</u> "	
115	Wood	83	C	P	There was a lot of discussion on previous ballots regarding the placement of sections such as (e). After seeing Chapter 23, I agree and think that references should be provided in the other chapters. In this case, the foundations chapter should refer to the appropriate section in Chapter 23. This is a general comment, and perhaps it should be discussed within the Steering Committee.	
143	Becker	98	N	P	With the exception of (a), the provisions in this section have nothing to do with design. They are instructions to the contractor. Somehow the LDP will have to know to copy these provisions into the specifications. This is not necessarily clear because 23.4.1 is explicit that the construction documents have to include the following item whereas 23.4.2 does not include such an instruction. I would first suggest that all of 23.4.2 except (a) be moved to 301. If that is not acceptable, I suggest that 23.1.1 be the instructing provision for including this stuff in the construction documents and we get rid of all other statements instructing inclusion to avoid confusion on when it applies and when it doesn't.	
145	French	98	N	P	Line 98 and elsewhere throughout Chapter 23, sometimes the headings give an overarching statement (e.g., line 75) that reference the subsections (a)..(##). Some sections do not. Prefer changing to reference the subsections here and elsewhere. Also see comments associated with lines 75 & 87, etc. Change to: "Concrete production and delivery information to be specified in construction documents shall include (a) through (g) as applicable."	

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146	Frosch	98	N	P	<p>What is required for the designer to do here? There is no action. Something is needed here such as:</p> <p>“For production and delivery of concrete, construction documents shall indicate (a) through (g)”</p> <p>If we improve the format and provide a general section to make clear that this is providing information that needs to be addressed in the specifications, then perhaps we don't need this type of language throughout.</p>	
147	Kelly	98	C	P	<p>This section, 23.4.2, appears to be directed to the contractor rather than to the LDP. The intent is for the LDP to include information about production and delivery of concrete in the contract documents. This needs to be stated at the start of this section. Will the commentary state that the requirements can be achieved by specifying that ACI 301 is applicable?</p>	
148	Sanders	98	N	P	<p>There needs to be a transition sentence that explains what is in (a) through (g). Could use the same method as in 23.3.1, “Construction documents shall specify (a) through (g) on code version and information on loads:” or could add a general statement at the beginning of 23.4 like what is in 23.9.1.</p>	
149	Seguirant	98	N	P	<p>It is not at all clear who is supposed to do what with these provisions. For example, is the LDP supposed to specify part (a) in the construction documents? If so, the provision doesn't say that. My understanding is that, philosophically, the LDP will not be permitted to reference ACI 318 in the construction documents, since the contractor is only required to meet the requirements of the construction documents and not the Code. Accordingly, the LDP cannot reference Chapter 5 of ACI 318, even though this provision requires that it be met. Does the LDP need to recreate the provisions of Chapter 5 in the construction documents?</p>	
173	Kelly	122	C	P	<p>This section, 23.4.3, appears to be directed to the contractor rather than the LDP. The intent is for the LDP to include information about placement and consolidation of concrete in the contract documents. This needs to be clearly stated at the start of this section.</p>	
233	French	158	C	P	<p>Change to:</p> <p>“Concrete curing information to be specified in construction documents shall include (a) through (d) as applicable.”</p>	
234	Kelly	158	N	P	<p>It is unclear whether this section is directed to a contractor or the LDP? Therefore, 23.4.4 should state that the LDP should address the items in this section by listing requirements for</p>	

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					the contractor in the construction documents. Instead, items (a) to (c) appear to be directed to the contractor and item (d) appears to be addressed to the engineer. If	
235	Sanders	158	N	P	There needs to be a transition sentence that explains what is in (a) through (d). Could use the same method as in 23.3.1, "Construction documents shall specify (a) through (d) on code version and information on loads:" or could add a general statement at the beginning of 23.4 like what is in 23.9.1.	
259	Wood	174	C	P	Why is the phrase "indicate in construction documents" included here? The entire chapter is a list of things that need to be specified in the construction documents.	
261	Carino	176	N	P	See my general comment about the need for an introductory sentence.	
262	Kelly	176	N	P	Clarify what is being required. Section 23.4.5 appears to be addressed to a contractor. I think that this section should be recast as requirements that the LDP should address such as including these requirements in the contract documents for the contractor to address.	
263	Sanders	176	N	P	There needs to be a transition sentence that explains what is in (a) through (c). Could use the same method as in 23.3.1, "Construction documents shall specify (a) through (c) on code version and information on loads:" or could add a general statement at the beginning of 23.4 like what is in 23.9.1.	
264	Becker	177	N	P	To get this in better language for a specification, I would suggest "Indicate in the construction documents acceptable concrete mixing and placing temperatures and concrete protection procedures when air temperatures below 40° F are anticipated." The commentary could then state that specifying ACI 306.1 is deemed to satisfy.	
265	Hover	177	C	P	Suggested revision: <u>Provide equipment and supplies to heat concrete materials and protect concrete from cold weather when the National Weather Forecast predicts air temperature below 40 °F.</u> <i>Discussion: I don't really care whether the forecast is NOAA, Naval Observatory, or the Weather Channel, but if we are going to get into the specification business, we have to have an unambiguous information source. Further, most forecasts merely predict the temperature without a probability or likelihood of reaching that temperature. We don't want compliance arguments about what some radio or TV weather-person happened to say, or Channel 3 said low 40's but Channel 5 said high 30's.</i>	
284	Carino	187	C	P	See my general comment about the need for an introductory sentence.	

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285	French	187	C	P	Change to: “Hot weather concreting information to be specified in construction documents shall include (a) through (c) as applicable (a) Control of ingredients (b) Production methods Handling, placing, protection and curing to prevent excessive concrete temperatures or water evaporation that could impair required strength or serviceability	
286	Sanders	187	N	P	See comment on Sanders 176	
287	Becker	188	N	P	To get this in better language for a specification, I would suggest “Indicate in the construction documents acceptable procedures for production, handling, placing, protection, and curing to prevent excessive concrete temperatures or water evaporation that could impair required strength or serviceability of the member or structure.” The commentary could then state that specifying ACI 305.1 is deemed to satisfy.	
297	Carino	192	N	P	See my general comment about the need for an introductory sentence.	
298	French	192	C	P	Change to: “Construction joint information to be specified in construction documents shall include (a) through (i) as applicable.”	
301	Sanders	192	N	P	See comment on Sanders 176	
351	Frosch	219	N	P	The wording of this section is not consistent with the wording of the previous sections. By changing to identify, it removes the specification guidance. If we want to go this direction, we need to revise other sections also. The section in itself, however, is not consistent as item (d) goes back to the “shall be” format instead of rewording with “Indicate”	
352	Kelly	219	N	P	This provision is not parallel sentence structure to other section. I recommend that the model in 23.4.1 be used. Therefore, I suggest: “23.4.8 – Construction documents shall specify (a) through (d) for construction of members, as applicable:	
353	Sanders	219	N	P	See comment on Sanders 176	
357	Kelly	220	N	P	Why are we suddenly using “indicate” at the start of (a), (b) and (c) when we have not done it elsewhere in this chapter? If “indicate” remains it belongs at the start of (d).	
401	Bondy	235	N	P	By limiting 23.5.1 to just items (a) through (j) there is an implication that Sections 23.5.2 through 23.5.4 (the rest of Section 23.5) do not have to be included in construction documents, if they apply to the project. That violates 23.1.1 so it should be clarified. Suggest “ 23.5.1 – <i>The provisions of 23.5 shall be included in</i>	

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					<i>construction documents as applicable.</i> That would be consistent with the present wording of 23.9.1 .	
430	Carino	252	N	P	See my general comment about the need for an introductory sentence.	
431	French	252	C	P	Change to: "Reinforcement tolerances to be specified in construction documents shall include (a) through (c) as applicable."	
432	Sanders	252	N	P	See comment on Sanders176	
456		263	N	P	See my general comment about the need for an introductory sentence.	
457	French	263	C	P	Change to: "Reinforcement placement to be specified in construction documents shall include (a) through (c) as applicable."	
458	Sanders	263	N	P	See comment on Sanders176	
480	French	282	C	P	Change to: "Welding of reinforcement to be specified in construction documents shall include (a) and (b) as applicable."	
481	Sanders	282	N	P	See comment on Sanders176	
502	Bondy	299	N	P	<p>I object to isolating these requirements in a separate section called "Construction requirements". Section 23.1.1 requires that everything in Chapter 23 must be included, by the LDP, in construction documents as applicable. However calling these several requirements in 23.6.2 "Construction requirements", as if they are somehow different from other construction requirements in Chapter 23, and isolating them in a separate section, could lead to confusion.</p> <p>Isolating these requirements in 23.6.2 also seems to imply that 23.6.1 does not apply to 23.6.2, and it most certainly does. So to avoid any confusion, delete the heading 23.6.2, and make the items presently in 23.6.2 continuations of 23.6.1. Thus item 23.6.2(a) would become item 23.6.1(e) and so on. Alternatively change 23.6.1 to "<i>The provisions of 23.6 shall be included in construction documents as applicable.</i>" That would be consistent with the present wording of 23.9.1.</p> <p>The LDP has always been responsible for incorporating these Code construction requirements into his/her construction documents. The committee is not inventing any wheels here, or making any changes from 318-11. Collecting these requirements in one place (Chapter 23) will just make it easier for LDPs to comply with the Code.</p>	

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					<p>Every general building code for many decades has had a requirement that the LDP clearly include all applicable code requirements into contract documents. In the current IBC it appears in 106.1.1, and for emphasis I will repeat it here:</p> <p><i>"106.1.1Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official."</i></p> <p>A similar requirement appeared in UBC for many editions back through the 40s. This means, of course, that contractors satisfy the Code by building in accordance with the construction documents. The contractor has no responsibility to root through the Code and determine (1) if a particular requirement relates to construction, and (2) if it is applicable to the particular project. That's what the LDP is supposed to do. If it's in the Code, and if it is applicable to the project, it must be in the construction documents. If it's not in the construction documents, it doesn't apply to the project.</p> <p>I should also point out that the INTRODUCTION to ACI 318, ACI 301, and the Responsibility Committee (132) all discourage general references in the construction documents requiring that the contractor conform to the Code.</p> <p>Any implication that the requirements in 23.6.2 do not have to be included, by the LDP in construction documents, if they apply to the project, would be a violation of the general building code, and we should avoid any possibility of misinterpretation here..</p>	
503	Carino	299	N	P	See my general comment about the need for an introductory sentence.	
505	Holland	299	N	P	Having a section titled "Construction requirements" in this chapter is not appropriate. The entire chapter is construction requirements. This section is supposed to contain requirements for the contractor that are not in the specifications. That makes the requirements entirely unenforceable. These requirements must be written to follow the format of the remainder of the chapter.	
506	Sanders	299	N	P	See comment on Sanders176	
564	Carino	351	N	P	The provision is confusing. The LDP is required to place information in the construction documents but who is responsible	

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					for placing information on shop drawings? I think that the intent is that the construction documents should require that the contractor provide certain information on shop drawings.	
565	French	351	C	P	<p>"Shop drawings" should be considered as part of the "construction documents"</p> <p>Also rearrange the sentence to indicate: "Precast member information to be included in contract documents should include (a) through (c) as applicable."</p>	
568	Bondy	359	N	P	<p>I object to isolating these requirements in a separate section called "Construction requirements". Section 23.1.1 requires that everything in Chapter 23 must be included, by the LDP, in construction documents as applicable. However calling these several requirements in 23.7.2 "Construction requirements", as if they are somehow different from other construction requirements in Chapter 23, and isolating them in a separate section, could lead to confusion.</p> <p>Isolating these requirements in 23.7.2 also seems to imply that 23.7.1 does not apply to 23.7.2, and it most certainly does. So to avoid any confusion, delete the heading 23.7.2, and make the items presently in 23.7.2 continuations of 23.7.1. Thus item 23.7.2(a) would become item 23.7.1(d) and so on. Alternatively change 23.7.1 to "<i>The provisions of 23.7 shall be included in construction documents as applicable.</i>" That would be consistent with the present wording of 23.9.1.</p> <p>The LDP has always been responsible for incorporating these Code construction requirements into his/her construction documents. The committee is not inventing any wheels here, or making any changes from 318-11. Collecting these requirements in one place (Chapter 23) will just make it easier for LDPs to comply with the Code.</p> <p>Every general building code for many decades has had a requirement that the LDP clearly include all applicable code requirements into contract documents. In the current IBC it appears in 106.1.1, and for emphasis I will repeat it here:</p> <p><i>"106.1.1Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official."</i></p>	

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					<p>A similar requirement appeared in UBC for many editions back through the 40s. This means, of course, that contractors satisfy the Code by building in accordance with the construction documents. The contractor has no responsibility to root through the Code and determine (1) if a particular requirement relates to construction, and (2) if it is applicable to the particular project. That's what the LDP is supposed to do. If it's in the Code, and if it is applicable to the project, it must be in the construction documents. If it's not in the construction documents, it doesn't apply to the project.</p> <p>I should also point out that the INTRODUCTION to ACI 318, ACI 301, and the Responsibility Committee (132) all discourage general references in the construction documents requiring that the contractor conform to the Code.</p> <p>Any implication that the requirements in 23.7.2 do not have to be included, by the LDP in construction documents, if they apply to the project, would be a violation of the general building code, and we should avoid any possibility of misinterpretation here..</p>	
569	Carino	359	N	P	Need an introductory sentence to state that the LDP will incorporate these requirements in the construction documents. The contractor should not have to refer to ACI 318 to find out what is required for precast concrete.	
570	Holland	359	N	P	Having a section titled "Construction requirements" in this chapter is not appropriate. The entire chapter is construction requirements. This section is supposed to contain requirements for the contractor that are not in the specifications. That makes the requirements entirely unenforceable. These requirements must be written to follow the format of the remainder of the chapter.	
571	Sanders	359	N	P	See comment on Sanders176	
585	Bondy	391	N	P	<p>I object to isolating these requirements in a separate section called "Construction requirements". Section 23.1.1 requires that everything in Chapter 23 must be included, by the LDP, in construction documents as applicable. However calling these several requirements in 23.8.2 "Construction requirements", as if they are somehow different from other construction requirements in Chapter 23, and isolating them in a separate section, could lead to confusion.</p> <p>Isolating these requirements in 23.8.2 also seems to imply that 23.8.1 does not apply to 23.8.2, and it most certainly does. So to avoid</p>	

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					<p>any confusion, delete the heading 23.8.2, and make the items presently in 23.8.2 continuations of 23.8.1. Thus item 23.8.2(a) would become item 23.8.1(d) and so on. Alternatively change 23.8.1 to <i>"The provisions of 23.8 shall be included in construction documents as applicable."</i> That would be consistent with the present wording of 23.9.1.</p> <p>The LDP has always been responsible for incorporating these Code construction requirements into his/her construction documents. The committee is not inventing any wheels here, or making any changes from 318-11. Collecting these requirements in one place (Chapter 23) will just make it easier for LDPs to comply with the Code.</p> <p>Every general building code for many decades has had a requirement that the LDP clearly include all applicable code requirements into contract documents. In the current IBC it appears in 106.1.1, and for emphasis I will repeat it here:</p> <p><i>"106.1.1Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official."</i></p> <p>A similar requirement appeared in UBC for many editions back through the 40s. This means, of course, that contractors satisfy the Code by building in accordance with the construction documents. The contractor has no responsibility to root through the Code and determine (1) if a particular requirement relates to construction, and (2) if it is applicable to the particular project. That's what the LDP is supposed to do. If it's in the Code, and if it is applicable to the project, it must be in the construction documents. If it's not in the construction documents, it doesn't apply to the project.</p> <p>I should also point out that the INTRODUCTION to ACI 318, ACI 301, and the Responsibility Committee (132) all discourage general references in the construction documents requiring that the contractor conform to the Code.</p> <p>Any implication that the requirements in 23.8.2 do not have to be included, by the LDP in construction documents, if they apply to the project, would be a violation of the general</p>	

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					building code, and we should avoid any possibility of misinterpretation here..	
586	Carino	391	N	P	See my general comment about the need for an introductory sentence.	
587	Holland	391	N	P	Having a section titled "Construction requirements" in this chapter is not appropriate. The entire chapter is construction requirements. This section is supposed to contain requirements for the contractor that are not in the specifications. That makes the requirements entirely unenforceable. These requirements must be written to follow the format of the remainder of the chapter.	
588	Sanders	391	N	P	See comment on Sanders176	
634	Sanders	441	N	P	See comment on Sanders176	
640	Anderson	449	C	P	<p>(Lines 449 – 513) Who is the audience for this section? Section 23.9 is mainly speaking to the contractor, the contractor's engineer, or both. A lot of the material in 23.9 is not under the LDP's control. Section 23.9.1 tries speaking to the LDP to include the info in the CDs, but the clarity of the requirements / responsibilities is getting lost. And then we have the following sections included that are speaking to the LDP directly:</p> <p style="padding-left: 40px;">Section 23.9.3 (g) ~ shoring requirements in design</p> <p style="padding-left: 40px;">Section 23.9.4 (h) ~ requirements in design for shoring removal</p> <p>Perhaps we need a different organization to the section, so the responsibility is spelled out more clearly and under the appropriate section / sub-sections:</p> <p>23.9.1 - The licensed design professional shall include the following provisions in construction documents, as applicable, for the contractor's design, fabrication, installation, and removal of formwork.</p> <p>23.9.1.1 – Design of formwork . .</p> <p>(a) . . .</p> <p>23.9.1.2 – Performance requirements . . .</p> <p>23.9.1.3 – Removal of formwork . .</p> <p>23.9.1.4 – Construction loads</p> <p>23.9.2 – For shoring requirements for composite construction, the licensed design professional shall indicate:</p> <p>(a) if shoring is required for composite members when their design is based upon shoring during construction;</p> <p>(b) criteria for removal of shoring, when used. Criteria shall be stated in terms of design properties required of supported elements to support all loads, and limits on deflections and cracking at time of shoring removal.</p>	
646	Frosch	463	C	P	Seems that a similar statement needs to be	

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					made in earlier sections of the chapter. We really need to consider how to make this chapter flow and connect better.	
647	Wood	463	C	P	Recommend deleting 23.9.1, as similar statements are not provided in other sections of Chapter 23. See comment online 71.	
27	Rogowsky	63	N	T	Clause 23.1.1 is vague in that it just says the information needs to be somewhere in the construction documents. I believe that we need to stipulate what needs to be on the drawings. The guiding principle should be that the drawings must contain enough information that one can perform a structural design check. In Canada and most places that I have worked, we have a section of the General Notes called "Design Data" where the information necessary to perform a design check is listed (i.e., codes, loads, material strengths, etc...) These items are identified in subsequent comments below.	
39	Kelly	67	C	T	The second sentence belongs in the commentary not the code.	
79	Rogowsky	75	C	T	Information in 23.3 should be on the drawings with the possible exception of tolerances which are more properly located in the specifications.	
83	Anderson	78	C	T	We are actually requiring dimensional tolerances to be in the CDs? This seems pretty extreme. How about: (b) Dimensional tolerances for members shall be in accordance with ACI 117.	
84	Browning	78	C	T	Add reference to ACI 117 in commentary	
85	Corley	78	N	T	Great addition to code but I believe this is new business. It needs to be identified as such.	
86	Hover	78	C	T	Suggested revision: Dimensional tolerances for members if other than required in this code.	
87	Kelly	78	N	T	I hope that the commentary will clarify that referring to ACI 117 is an acceptable means of complying with the requirement to include dimensional tolerances on the construction documents. I have rarely listed or seen specific dimensional tolerances on drawings other than referring to ACI 117 and occasionally including the tolerance on depth in ACI 318-11 section 7.5.2.1. Every now and then a project requires tighter tolerances than those of ACI 117, which than belong on the drawings and/or the specifications. Perhaps this section could be revised to state that this is the case or it could be clarified in the commentary.	
88	Schaeffer	78	N	T	This new provision is too vague for a requirement to give dimensional tolerances in the CDs. Suggest a reference to 301.	
89	Wyllie	78	N	T	What does this mean? You cover tolerances in 23.5.2. The Commentary of that section sends one to ACI 117, although 318 has never fully	

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					endorsed 117. I believe we should delete this item here.	
90	Bondy	79	N	T	<p><i>“Details for dimensional changes resulting from....”</i> is just too vague to be of any use. <i>“Details for dimensional changes...”</i>??? What could that possibly mean??? The actual wording in 1.2.1(g) is “Provision for dimensional changes resulting from...” which is a little better because it suggests that the LDP show on the construction documents how the effects of dimensional changes will be mitigated, i.e., what are you going to do about them? Suggest, <u>“Details Provisions for mitigating the effects of dimensional changes resulting from prestressing....”</u></p>	
91	Carino	79	N	T	I think the word “details” is ambiguous. Can we just start the provision with “Dimensional changes”?	
92	Frosch	79	C	T	Insert <u>“to accommodate</u> dimensional changes ...” after “Details”	
93	Kelly	79	N	T	Rather than “Details for...” go back to “Provisions for...” as it appears in ACI 318-11, or use “Provisions or details...”. Reasons why include using the shrinkage compensating admixtures which is a provision to deal with shrinkage rather than a detail.	
94	Seguirant	79	N	T	Go back to the wording of 318-11, <i>“Provision for dimensional changes resulting from creep, shrinkage, and temperature”</i> . The phrase <i>“details for dimensional changes...”</i> can be misconstrued to require the LDP to provide actual dimensional changes, whereas the intent is only to provide details to accommodate estimated dimensional changes.	
95	Wyllie	79	N	T	Change “Details” back to “Provisions” as in current code. The provision may be delayed pouring of a closure strip.	
96	Becker	81	C	T	If this stays here, it needs to be deleted from 20.13.3.4.	
97	Becker	81	N	T	In keeping with the underlying intent, if this is in the specification, what does the contractor do with it? They are not responsible to read the commentary to find out they cannot do any sawcutting in it. Also, why would this not apply to all slabs designed as diaphragms? Suggest <u>“(d) Identify Slabs-on-ground that are designed as a structural diaphragm or a structural diaphragm and as part of a seismic-force-resisting system shall be identified and sawcutting in such slabs shall not be permitted unless approved by the Licensed Design Professional.</u>	
98	Carino	81	N	T	I don’t think the word “Identify” is needed and it seems to be the wrong word. The general requirement in line 75 is to specify (a) through (f). So, I think the wording here should “Those slabs-on-ground that are designed...”	

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99	Cleland	81	C	T	Delete "is" after "ground"	
100	Fiorato	81	C	T	For parallel sentence structure suggest replacing "Identify slabs-on-ground that are..." with "Identification of slabs-on-ground that are..."	
101	French	81	C	T	Keep parallel with (a)-(c). Change to: " Identify Slabs-on-ground..."	
102	Kopczynski	81	C	T	Change to "Identification of slabs-on-ground designed as structural diaphragms and part of the seismic force resisting system."	
103	Moehle	81	C	T	Write to be parallel expression with previous items. Same with next item.	
104	Parra	81	C	T	Use of word "Identify" is not consistent with wording in lines 75-76. Change to "Slabs-on-ground that are designed as..." Same in line 83. Change to "Sloped or stepped footings..."	
106	Wyllie	81	C	T	This may now need a cross reference to the new Diaphragm chapter.	
107	Becker	83	N	T	If this is in a specification, what does the contractor do with it? Suggest "(e) Identify that Sloped or stepped footings designed as a unit shall be constructed <u>detailed</u> to ensure action as a unit."	
108	Carino	83	N	T	As stated in the comment for line 81, I don't think that "identify" is the correct word. Suggest the provision be changed to: "Those sloped or stepped footings that are designed as a unit and that need to be constructed to ensure action as a unit."	
109	Fiorato	83	N	T	I understand this is a current Code provision, but what does the contractor do to meet the requirement: "shall be constructed to ensure action as a unit"? Suggest rewording to read something like: "Identification of sloped or stepped footings designed as a unit and construction details to ensure such action. <15.9.2>".	
110	French	83	C	T	Keep parallel with (a)-(c). Change to: " Identify that Sloped or stepped footings <u>that are</u> designed as a..."	
111	Frosch	83	C	T	Reword as follows: "Sloped or steeped foots that are designed as a unit and require construction to ensure action as a unit."	
112	Kelly	83	N	T	I have no idea what this section requires. I realize that it is directly from the current code but there is no existing commentary. Is this intended to address that the steps and sloped footing may be multiple pours? This section should be revised to something intelligible or it should be eliminated from future versions of the code. If the section is not eliminated it needs commentary.	

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					Is the sloped footing referred to in this section supposed to be a tapered footing as shown in Figure R16.1? Figure R16.1 at least helps with the definition of a stepped footings but does not define what a sloped footing is. When referring to sloped or stepped footings, I suspect that most engineers think of sloped or stepped strip footings rather than the figures in the Chapter 16 commentary.	
113	Kopczynski	83	C	T	Change to "Identification of sloped or stepped footings designed as monolithic and required to be constructed monolithic."	
114	Seguirant	83	N	T	This needs to be reworded for proper context – <i>"Identify that sloped or stepped footings that are designed as a unit, and that they shall be constructed to ensure action as a unit."</i>	
116	Wyllie	83	N	T	This is not what present 15.9.2 says. This does not need to be identified in the drawings. This is a statement to Contractor that stepped footings shall be constructed to ensure action as a unit. It is a construction requirement; not an item that needs to be shown in CDs.	
117	Hover	86	C	T	Ken's comment: It appears that slump is not on this list of concrete properties. Fine with me if this is an intentional omission.	
119	Rogowsky	87	C	T	If this information goes into the specification, (c) and (f) should be noted on the drawings as Design Data so that one can perform a design check.	
129	Carino	93	N	T	I find this provision confusing. Are we just asking for the value of specified strength used to design the member under the design loads? This specified strength drives the acceptance criteria. For the case of prestressed concrete, we also have required strengths at different stages of construction but I think these should not be called "specified strength" because these are not used for acceptance but would be used for evaluation of in-place strength. It seems that we are trying to put too much information into this one requirement and it loses clarity. I suggest we have a separate sentence on the required in-place strength at different stages of construction.	
130	Parra	93	C	T	Move "of concrete" after "specified strength".	
131	Seguirant	93	C	T	Although this is pretty close to the current Code, I find the wording confusing. Does the "for which the member is designed" apply to f'_c or the "ages or stages of construction"? Suggest " <i>The specified strength, fc', of concrete at ages or stages of construction for which the member is designed at stated ages or stages of construction.</i> "	
132	Wood	93	C	T	Delete "the" at the beginning of the sentence.	
133	Carino	95	N	T	I think we need to change this to; "Test age for	

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					demonstrating compliance with f'_c , if other than 28 days." This explains what the age refers to. f'_c is just a number but we have to give an age for testing the concrete to see if complies with that number.	
135	Wyllie	95	N	T	This is the same as line 93. Delete.	
136	Corley	96	N	T	This appears to be new business. Too many superlatives, try "Maximum size of coarse aggregate."	
137	Hover	96	C	T	Suggested revision: The largest permitted nominal maximum size of coarse aggregate if other than required in this code.	
138	Seguirant	96	C	T	Both " <i>largest</i> " and " <i>maximum</i> " are not needed. Suggest " <i>The largest permitted nominal maximum size of coarse aggregate permitted</i> ".	
139	Wood	96	C	T	Delete "the" at the beginning of the sentence.	
141	Corley	97	N	T	This appears to be new business.	
142	Weiss	97	C	T	Appears to be the only (as applicable)	
150	Anderson	99	C	T	Ingredients?	
151	Becker	99	N	T	If this is to be included in a specification, I don't think it can be stated this way with a reference to Chapter 5. However, it doesn't feel so bad if it is moved to 23.4.1 (g) and reworded as "ASTM specifications for concrete ingredients in accordance with Chapter 5."	
152	Gerber	99	C	T	Should "ingredients" be changed to "materials"?	
153	Becker	105	N	T	I do not understand why "clean" is not important. I think it should stay in. Also, "..or interfere with mixing efficiency" should not be added. If 318 is adopted as a law, do I go to jail if I am foolishly inefficient?	
154	Fiorato	105	N	T	I appreciate the need to be more explicit, but this proposed change is not clear or enforceable. Could we say something like "All equipment for mixing and transporting concrete shall meet the requirements in ASTM C94."?	
155	Weiss	105	C	T	Free is a very absolute word	
156	Wyllie	105	N	T	Keep the word clean and put a period after it. Delete new words. They are New Business needing a separate ballot.	
157	Corley	106	N	T	Not clear what is meant by "interfere with mixing efficiency". Commentary to explain this would satisfy my No vote.	
158	Jirsa	108	C	T	Reword "...and mixer shall be discharged completely before it is recharged." There are two requirements in sentence. I would prefer two sentences but that may violate some other rule of organization.	
159	Frosch	110	C	T	Insert comma after "mixed"	
160	Poston	110	C	T	This provision seems like two thoughts. Suggest making two provisions.	

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161	Wyllie	110	N	T	The underlined addition is New Business needing a new ballot.	
162	Frosch	111	C	T	Insert comma after "C94" and on the next line after "mixed"	
163	Parra	111	C	T	Either add a comma after ASTM C94 or make second part a separate item.	
164	Wood	111	C	T	Recommend adding a period after "ASTM C94." Delete "and" and begin second sentence with "Concrete."	
166	Jirsa	114	N	T	Lines 114-121. Wording seems awkward with use of "Be." Suggest deleting "comply with (i) through (iv)" in line 114?	
167	Frosch	115	C	T	Is "Be" necessary in front of all of these items (i) through (iv). Consider deletion.	
168	Poston	115	C	T	Suggest "Be" be deleted in each sub-provision.	
169	Becker	116	N	T	What is an "approved type" and how does it get approved? I disagree that the LDP should be doing this type of approval. And if not the LDP, then who?	
170	Carino	122	N	T	See my general comment about the need for an introductory sentence.	
171	French	122	C	T	Change to "Concrete placement and consolidation information to be specified in construction documents shall include (a) through (g) as applicable."	
172	Frosch	122	N	T	Consistent with my previous comment on line 98, suggest the following wording: "For placement and consolidation of concrete, construction documents shall indicate (a) through (g)"	
174	Sanders	122	N	T	There needs to be a transition sentence that explains what is in (a) through (g). Could use the same method as in 23.3.1, "Construction documents shall specify (a) through (g) on code version and information on loads:" or could add a general statement at the beginning of 23.4 like what is in 23.9.1.	
175	Wyllie	125	N	T	Keep the existing wording. This is a substantial change. Standing water is different from water which may continue to flow into area where concrete is to be placed. Where is the Building Official's permission? Use wording of 5.7.1 (f).	
176	Becker	126	C	T	Suggest removing "Standing".	
177	Jirsa	126	N	T	Reword "Standing water shall be removed before concrete is placed unless a tremie is to be used."	
178	Kopczynski	126	C	T	Change to "Standing water shall be removed at point of concrete placement unless a tremie is used."	
179	Poston	127	C	T	Suggest rewording to "...unless tremie is used."	
180	Carino	129	N	T	I questioned if "well drenched" is enforceable. How is the inspector going to verify that the	

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					units are well drenched? In the provision related to construction joints, we use “wetted and standing water removed.”	
181	Hover	129	C	T	Suggested revision: ...that will be are in contact with concrete shall be saturated well drenched . I am not sure that saturated is right. “Moist” is too vague. “Well drenched” is dramatic, but hard to evaluate.	
182	Kelly	129	C	T	“Well drenched” may not be the best descriptor even though it is current code language. I suggest: “Surfaces of masonry filler units that are in contact with concrete shall be saturated.”	
183	Kopczynski	129	N	T	This is vague. Reconsider the intent and reword more specifically...substitute different term for “well drenched”	
184	Parra	129	C	T	Change of “will be” to “are” is not correct.	
185	Wyllie	129	N	T	Keep words “will be” instead of “are”. If they are in contact it is too late to drench.	
186	Gerber	131	C	T	It appears awkward to use “concrete” and “placed/placement” twice in the same sentence. Here is a revision: <i>(d) Concrete shall be placed to ensure an adequate supply of concrete at the location of placement final position</i>	
187	Hover	131	C	T	Suggested revision: In accordance with the requirements of (i) through (vi), concrete shall be placed:	
188	Parra	131	N	T	Current wording is confusing and incompatible with wording in items (iii), (iv) and (v). Consider the following: “Concrete shall be placed in accordance with (i) through (iv): (i) Without separation... (ii) Without interruptions... (iii) As near to its final location... (iv) As a continuous operation... Also, item (v) does not belong here. It should be made a separate item at the level of (d).	
189	Wood	131	C	T	“vi” should be “v.”	
190	French	132	C	T	Change “(vi)” to “(v)”	
191	Seguirant	132	C	T	Should be (i) through (v).	
192	Hover	133	C	T	Suggested revision: (i) Without segregation separation of ingredients or loss of materials	
193	Becker	134	C	T	Does “cold joint” need a definition?	
194	French	134	N	T	Sometimes by nature of construction there may be intentional cold joints. Change to “ would could result in unintentional	

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					cold joints"	
195	Hover	134	C	T	Suggested revision: (ii) Without interruptions or loss of plasticity between successive placements that would result in cold joints. Identified as a technical change	
196	Wyllie	134	N	T	This is a change of words. Keep to loss of plasticity. Cold joints is different.	
197	Wyllie	136	N	T	Keep old words of 5.10.1. Segregation is different from rehandling or flowing.	
198	French	137	N	T	I think it is good to keep the "rehandling" It makes it clear that you cannot just place it near final location by using multiple means.	
199	French	139	C	T	Reorganize. (iv) is very similar to (ii)	
200	Corley	142	N	T	This would allow retempering concrete after beginning of initial set. After "has" insert "been retempered or".	
201	French	142	C	T	Prefer keeping "partially hardened" I think it is clear.	
202	Frosch	142	N	T	I feel that "partially hardened" is pretty clear. Without this, we seem to lose this idea from the code. I have actually been on a job where this was a problem. Consider retaining unless we have this covered somewhere else.	
203	Kelly	142	N	T	Concrete that has begun to harden should not be deposited in the Work. Find a suitable replacement for "partially hardened concrete" such as "concrete that has begun to harden" or leave the undefined term.	
204	Seguirant	142	N	T	Disagree with deleting " <i>partially hardened</i> ". Although the term is not officially defined, it is plain English that should be understood. We can't possibly be expected to define every use of the English language.	
205	Wyllie	142	N	T	Keep old words. Keep partially hardened and contaminated by foreign materials.	
206	Wyllie	145	N	T	Keep old words of 5.10.8. "... shall be thoroughly consolidated by suitable means ..."	
207	Anderson	146	C	T	Add comma after "fixtures"	
208	Gustafson	146	C	T	Replace "embedded fixtures" with "embedments". Line 291, for example, speaks of "embedments" rather than "embedded fixtures".	
209	Becker	147	N	T	What does this mean and how can I comply with it if the top of my wall has a 30° slope? Does this imply that I have to form that top surface? I suggest that this provision has no place in the code.	
210	Bondy	147	N	T	"...generally level..." is unenforceable. Provide a quantitative criteria or move to Commentary.	
211	Corley	148	N	T	According to ACI 116, job site addition of water is "tempering." Retempering is adding water	

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					after loss of workability. "Retempering" should not be permitted. How do I know when "retempering" will reduce quality and strength of my concrete?	
212	French	148	N	T	It seems that there may be instances where adding water should not be allowed.	
213	Kelly	148	C	T	Adding water at the site is not the same as retempering concrete, is it? The water may simply have been held back at the batch plant. Does ASTM C94 specifically state that concrete may be retempered?	
214	Seguirant	148	N	T	Disagree with deleting this provision and the provision on line 151 as part of reorganization. This should be a separate technical ballot that is thoroughly vetted based on its technical merits.	
215	Wyllie	148	N	T	Keep old 5.10.4 words. While ASTM C94 may allow for jobsite addition of water, this is different from shall not be used unless approved by LDP.	
216	Corley	151	N	T	If this is not enforceable, let's write something that can. The quality of concrete when remixed cannot be as good as concrete that is not remixed.	
217	French	151	N	T	This section has value and should be kept.	
218	Wyllie	151	N	T	Keep this existing wording unless you have a separate ballot on a technical change.	
219	Frosch	154	C	T	Insert comma before "column"	
220	Becker	154	N	T	It is incorrect to have this provision in Ch 23 for several reasons. First, it is all covered in 17.2.2. Second, this is really about what design strength to be using so it is not a construction requirement nor should it be placed in a specification. Finally, as stated, it contradicts 17.2.2 which provides options other than extending the concrete 2 ft into the slab. Please delete.	
221	Browning	154	C	T	Reference should be 17.2.2.5 per CE171	
222	Carino	154	N	T	It is not necessary to refer to the Code section (it is no longer 17.5.2). Use words rather than notation. Make it clear what the LDP is supposed to do. I do not see the reason for referring to 23.4.8(a) and (b). There are no joints because the slab concrete has to be placed before the slab concrete undergoes setting (that's implied by the word "integrate"). Revise to: (g)If the specified compressive strength of the column concrete is greater than 1.4 times the specified strength of the slab concrete, specify in construction documents that the column concrete shall extend at least 2 ft into the floor system from the face of the column and that the column concrete shall be integrated with floor concrete. . <10.12.1>	
223	Fiorato	154	N	T	This provision seems out of place, or may not even be needed. Instead, should we add a more	

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					general requirement that the construction documents must show the location of all classes of concrete? The requirement for the joints is already in 23.4.	
224	Hover	154	C	T	<p>Suggested revision: Column concrete shall be integrated with floor concrete. <u>Both the column concrete and the floor concrete shall be sufficiently plastic to enable thorough integration and consolidation without development of a cold joint.</u></p> <p><i>Discussion: one of the biggest risks in this construction operation is getting a cold joint at just about exactly the location of the critical perimeter for punching shear or at about the terminus of the shear studs. I agree that the "two foot" rule helps.</i></p>	
225	Kelly	154	N	T	Item (g) appears to be out of place in 23.4.3. All of the other provisions appear to be directed towards a contractor and then this section appears to be directed to an engineer. All of the items should be clearly directed to the LDP.	
226	Seguirant	154	N	T	This provision needs to be modified and coordinated with Chapter 17. Section reference 17.5.2 is not correct, it should be 17.2.2.3. Even then, this is only one of three options permitted for transmission of column loads under these conditions. This provision should instruct the LDP that, if 17.2.2.3.1 is used for design, he must then specify 17.2.2.3.1(a) and 17.2.2.3.1(b) directly in the construction documents.	
227	Wood	154	C	T	This section includes too much information from 17.2.2.3.1 (referenced section needs to be updated). Suggest something like "If column concrete is integrated concrete in the slab system in accordance with 17.2.2.3.1, concrete shall be placed in accordance with 23.4.8(a) and 23.4.8(b)." I did not find 23.4.8(a) and 23.4.8(b) to really describe the situation of puddling column concrete in the joint region. Perhaps, the appropriate provisions should just be given here.	
228	Wyllie	154	N	T	This is a design condition covered in new 17.2.2 conveniently buried on this ballot. Why is this here? New 23.4.8 (a) and (b) are a different issue.	
229	Gustafson	155	C	T	Delete the period in "ft."	
230	Corley	156	C	T	What are "these joints"? According to ACI 116, a "joint" is a "separation". Section 2.3.4.8(a) and (b) do not seem relevant.	
231	Parra	156	C	T	Consider following wording: "shall be integrated with floor concrete and placed in accordance..." Also, current wording in 23.4.8(a) and 23.4.8(b) needs to be changed to make it compatible with this section. See my comments on lines 220 and 224.	

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232	Carino	158	N	T	See my general comment about the need for an introductory sentence.	
236	Gerber	159	C	T	And Line 162. These two lines are slightly inconsistent: Line 159 says "at least 50° F", while Line 162 says "above 50° F." I would suggest the wording in Line 159 be copied to Line 162.	
237	Kopczynski	159	N	T	Sections 23.4.4(a) and (b) can be combined. Change both concrete types to "of at least 50..."; then rewrite to include "the first 7..." and "the first 3..." in the same sentence. Also, what is the definition of "high-early-strength"?	
238	Wood	164	C	T	Should 24.4.4(c) be 23.4.4(c)?	
239	Corley	165	C	T	Something is missing. How long must concrete be kept at 50°F if accelerated curing is used?	
240	Fiorato	165	N	T	The added wording should be in the Commentary.	
241	Kelly	165	C	T	I am not sure that the clarification "to accelerate strength gain or reduce curing time" is appropriate as code language. The commentary should be used for clarifications.	
242	Kelly	165	N	T	The provision in (c) does not make sense. "Accelerated curing is permitted... in accordance with (i), (ii), and (iii)" is inappropriate. Only item (i) is directly related to accelerated curing and follows correctly from (c). Item (ii) is a reason for using accelerated curing but is not accelerated curing itself, so it does not follow logically from (c). Item (iii) also does not follow logically from (c) either. It is a separate requirement that accelerated curing shall not compromise durability rather than a type of accelerated curing. This section needs to be rewritten. I suggest that item (i) be incorporated into the introduction sentence of (c). Item (ii) belongs in the commentary, and Item (iii) belongs as a second sentence to (c) or a sub-requirement of the revision to (c) that I recommend.	
243	Seguirant	165	C	T	Replace "is" with "shall be".	
244	Wood	165	C	T	Is it possible to revise this sentence such that "accelerated" and "accelerate" are not the first and fifth words? It seems redundant.	
245	Jirsa	166	C	T	Don't understand "to clarify reasons" maybe "to clarify purpose" would be better.	
246	Becker	169	N	T	Lines 169 through 173 are nice motherhood and apple pie provisions. I have no idea how these provisions have been enforced in the past. Now the LDP is supposed to put them in the specification. In my opinion, the language is inadequate for a specification. Does the contractor have to submit for approval to use accelerated curing? What tests, data, or calculations have to be submitted to show conformance with these two provisions? I am	

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					not sure how to suggest a fix.	
247	Corley	169	C	T	Perhaps this should be new business but this seems to completely do away with 23.4.4(a) and (b). Is this what is intended?	
248	French	169	N	T	It would be good if clauses (i) through (ii) were written in parallel. Change to: “Curing shall produce concrete with compressive strength of concrete at the load stage considered achieves compressive strength at least equal to required design...”	
249	Carino	170	N	T	I don't know what “design strength” is referring to. In the application of this provision, one would determine if the in-place strength is adequate to sustain the applied loads. So change “design” to “in-place.” See my comment for line 93.	
250	Carino	172	C	T	I still maintain that this is not enforceable unless a test method is specified to measure a durability related characteristic (such as electrical conductivity of a saturated specimen). Without such a method for checking compliance, this just “fluff.” Can we address this as new business?	
251	Weiss	172	C	T	This is quite vague	
252	Browning	174	C	T	No need to add “in construction documents” since the entire chapter refers to items in the construction documents	
253	Carino	174	N	T	It is not clear who is responsible for this testing. If this testing is done by the Owner, then this provision provides information to the contractor of what will happen during construction. In this case, the word “shall” needs to be replaced by “will.” If “shall” is used, it implies that the contractor is responsible for this testing.	
254	French	174	N	T	With new title, see line 158, change to: “ Indicate in construction documents if Supplementary strength tests if required in accordance with 22.5.4 shall be performed to verify adequacy of curing.	
255	Frosch	174	C	T	Is the wording “in construction documents” necessary. Isn't this entire chapter about what is to be included in the construction documents? Suggest deletion.	
256	Kelly	174	N	T	Item (d) is clearly addressed to the LDP while the other items appear to be addressed to the contractor. Please rewrite 23.4.4 so it is clear that the LDP is required to do something and for parallel structure to the list of items.	
257	Parra	174	C	T	Consider following wording: “Construction documents shall indicate if supplementary strength tests...”	
258	Sanders	174	N	T	Remove “indicate in construction documents” Need to be consistent.	
260	Wyllie	174	N	T	Use words of old 5.11.4 as a positive statement	

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					rather than just to indicate this on CDs.	
266	Kelly	177	N	T	<p>As written, 23.4.5(a) requires adequate equipment to heat concrete materials but it does not require that the concrete materials be heated. It is also written as directions to a contractor rather than telling the LDP to require that the contractor address keeping the concrete warm.</p> <p>I suggest section 23.4.5 be rewritten as follows: "The LDP shall include requirements in the contract documents that the contractor shall prevent freezing of concrete during the curing period." The commentary could list the means that the engineer might require the contractor to take such as (i) heat concrete materials prior to batching, (ii) heat concrete after it is placed, and (iii) insulate the concrete, as appropriate. It might also provide clues as to what measures might be appropriate for various temperatures and directing the LDP to ACI 306R for additional guidance.</p>	
267	Wyllie	177	N	T	Use words of old 5.12.1 rather than these words with 40 degrees added. Freezing or near-freezing is clear. If the low is 39 degrees that is a bit above freezing as opposed to a high of 39 degrees; both being below 40 degrees.	
268	Anderson	178	C	T	Suggest adding the word "conditions" after weather, as it is the 'conditions' we are worried about. ". . . during weather conditions , when forecasts . . . "	
269	Corley	178	N	T	This is significant change. If weather does not get to 32°, there should not be damage. I like original wording. The words "or near freezing" could be eliminated.	
270	Fiorato	178	N	T	The added wording does not adequately define cold weather. Should this be in the Commentary with a reference to ACI 301?	
271	Kopczynski	178	C	T	Change to "protecting concrete when weather forecasts indicate..."	
272	Parra	178	N	T	What is "likely"? Whose forecast? I don't think this section can be enforced the way it is currently written. We may have to go back to previous wording.	
273	Becker	181	N	T	Delete "reinforcement". It is covered in 23.5.3 which seems to be a better place.	
274	Corley	181	N	T	This would allow placement of concrete with ice in it in cold weather. Is that what Sub. A intends?	
275	Wyllie	181	N	T	Why delete all concrete materials from this? Keep.	
276	Carino	184	C	T	The Commentary will need to provide a rationale for prohibiting frozen materials.	
277	Corley	184	C	T	This does not prohibit placement of concrete	

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					that still has chunks of ice in it.	
278	Kelly	184	N	T	This seems more appropriate as a requirement for an ASTM specification rather than ACI 318. If ice in aggregate can be used for cold weather concreting why can't frozen materials that thaw also be used? Either leave it as it was or eliminate this section altogether.	
279	Seguirant	184	N	T	Disagree with deleting " <i>or materials containing ice</i> ". Is it acceptable to use aggregates with ice that melts during mixing and increases the w/cm beyond what is specified?	
280	Weiss	184	C	T	What about when ice is used or is this covered since cold weather is mentioned	
281	Wyllie	184	N	T	Keep "or materials containing ice" If aggregate stock piles contain ice, melt the ice <u>before</u> using the materials.	
282	Fiorato	185	N	T	While it may be true that aggregates contain ice that melts during production, is it an acceptable practice to use such aggregates? Should we be leaving these issues to ACI 301? It is not clear that many of these construction provisions should even be in ACI 318.	
283	French	185	C	T	Put "aggregate stockpiles may contain ice that melts during the production process" in commentary	
288	Corley	188	N	T	There is no requirement, only a list of actions? Do we mean the list of items "shall be controlled"?	
289	Frosch	188	N	T	This provision is a fragment. One possibility to correct is to add "shall be provided" at the end of the sentence.	
290	Kelly	188	N	T	I suggest: "The contract documents shall include requirements for the contractor to control ingredients, production methods...that could impair required strength or serviceability of the member or structure."	
291	Kopczynski	188	C	T	Section 23.4.6 is written as a definition; needs to be reworded.	
292	Parra	188	C	T	Current sentence is incomplete. Consider the following: "Control of ingredients, production methods, handling, placing, protection, and curing <u>shall be implemented</u> to prevent excessive..." I also think "Methods for control of" may be more appropriate than "Control of".	
293	Seguirant	188	C	T	This is no longer a sentence since the verb has been deleted.	
294	Wight	188	C	T	As written, this is not a complete sentence. I think you want to say, Control of x to prevent y "shall be achieved". You could either make this change at the end of the sentence or go back to some of the initial wording that was deleted.	
295	Wyllie	188	N	T	Keep the old words. They are better.	

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296	French	189	C	T	If change is not made in accordance with line 187, rewrite this section as: “(a) Control of ingredients...and curing <u>shall be required</u> to prevent excessive...”	
299	Kelly	192	N	T	The title should be Joints not Construction Joints since more than just construction joints are being addressed. Rewrite this section to make it clear that the LDP shall consider the listed items in his or her design and include the requirements for joints in the construction documents.	
300	Kopczynski	192	C	T	Remove the colon after “joints”	
302	Becker	193	N	T	What about the details and location? Suggest adding “...shall be shown in the construction documents.” Also the second sentence should be revised. It implies that the requirement that locations be shown can be ignored. Suggest “Planned location of joints not <u>differing from those indicated in...</u> ”	
303	Corley	193	N	T	The first sentence requires no action and seems to be a heading. Do you mean these “shall be shown”?	
304	Dolan	193	C	T	This is awkward. The opening words are a phrase not a sentence and can probably be deleted as the second sentence is complete by itself. By the way, this is an example of an instruction to the contractor in the middle of a series of specifications – see my comment on line 0.	
305	French	193	N	T	Reorder some of the material in this section. (a), (d), (e), (f) seem like they should be located near each other, and (b), (c), (g), (h) should be located near each other.	
306	Frosch	193	N	T	The writing style of this chapter keeps jumping around. In many cases, it gives a specific action “shall be done, etc.” In other sections, it indicates something to identify such as on the plans. This makes it very difficult to follow. As noted in my general comment, the first sentence of (a) should be moved to 23.3 to be information included on the plans.	
307	Jirsa	193	N	T	Delete “planned”	
308	Kelly	193	N	T	I suggest: “The construction documents shall include details and locations of construction, contraction and isolation joints as required for the design. The construction documents shall include a requirement that if the contractor plans to eliminate joints or use other details or locations of joints than those on the drawings the contractor must submit his planned details and joint locations for review by the LDP.”	
309	Kopczynski	193	C	T	Remove the first sentence and reword the second to read “Planned location of	

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					construction, contraction and isolation joints not indicated..."	
310	Parra	193	C	T	I assume information in this section is to be added to construction documents. Thus, consider following change: " <u>Construction documents shall specify</u> details and location of construction, contraction and isolation joints."	
311	Rogowsky	193	N	T	The first sentence is an incomplete thought. I believe that this provision should say "Indicate details of construction, contraction, and isolation joints and well as where they are required or permitted. Proposed joint locations that differ from those in the construction documents shall be submitted for review by the licensed design professional."	
312	Wight	193	C	T	The first statement is not a complete sentence. After "joints" add, "shall be given in the contract documents", or whatever action is correct.	
313	Wyllie	193	N	T	This is not at all clear. I believe it was written as something to show on CDs but it does not say this.	
314	Corley	194	N	T	This is not clear. Do you mean "shall be submitted to the licensed design professional for approval"?	
315	Anderson	199	C	T	In the commentary, mention that a surface condition on the construction joint of saturated surface dry (SSD) is preferred. This is essentially what we have in the Code language.	
316	Kopczynski	199	C	T	Change "wetted" to "saturated"	
317	Wood	199	C	T	The term "wetted" seems awkward. How about "the surface of the construction joint shall be moistened and standing water removed."	
318	Kopczynski	202	N	T	Add "unless approved otherwise by the licensed design professional" to the end of the sentence.	
319	French	203	C	T	Keep wording parallel. Since (d) talks about "Construction joints in floor systems.." Keep (e) parallel: (e)Construction joints in girders shall be offset (i.e., go with the original wording).	
320	Corley	204	C	T	For clarity, I suggest "an intersecting beam and a construction joint in a girder."	
321	Kopczynski	205	N	T	Same comment as above.	
322	Fiorato	207	N	T	How does a contractor comply with this provision? Is it needed?	
323	Jirsa	207	N	T	How do you determine if a construction joint "impairs" strength? This sentence seems much weaker than original. Perhaps this will be addressed in Commentary. If sentence remains, suggest rewording "Construction.....shall not impair the strength of the structure."	

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324	Parra	207	C	T	Consider following wording: "Construction joints shall be located and constructed so as to not impair strength of structure."	
325	Wyllie	207	N	T	This provision should be after (c) above. Why is the second sentence deleted? It is important. A technical change.	
326	Corley	208	N	T	We still need to keep the requirements to transfer forces.	
327	Frosch	208	C	T	Insert "the" before "strength" and before "structure"	
328	Becker	211	N	T	I have to mildly object to this. The current provision is for seismic force resisting walls. As proposed, it would be generalized to all walls. The same provision currently is in the seismic chapter (20) and probably should be deleted here so it stays specific to seismic. Plus, (h) really covers it.	
329	Frosch	211	C	T	Insert comma before "and"	
330	Hover	211	C	T	Question: Does it make any difference if the joint in the wall is horizontal or vertical?	
331	Parra	211	C	T	It seems that this provision is not needed since it should be covered by item (h).	
332	Rogowsky	211	N	T	Clauses (f) and (g) should start with "Unless keys are provided..." When the construction joint is detailed with a key, there is no need for additional roughening.	
333	Seguirant	211	N	T	Suggest (g) and (h) be replaced by a single provision " <i>When concrete is placed against previously hardened concrete, the required intentional roughening of the hardened concrete surface shall be indicated. <11.6.9></i> " The LDP is responsible for the shear friction design which determines the level of intentional roughening required (either none or ¼" amplitude). Therefore, it is incumbent on the LDP to specify the required roughness in the construction documents.	
334	Wyllie	211	N	T	This is seismic provision, but ok. But old 21.9.9 refers to old 11.6.9 for ¼ inch amplitude to use mu of 1.0.	
335	Kopczynski	212	C	T	Change to "Construction joints for structural walls shall be roughened and the required amplitude indicated on the construction documents."	
336	Kopczynski	213	C	T	See comment above.	
337	Wood	213	N	T	In 318-08, 11.6.9 was limited to the provisions for shear friction. In the reorganized code, 23.4.7(h) applies everywhere. This would be a huge technical change. Even within Chapter 17, there are several sets of requirements for surface preparation (Table 17.6.5.2 for shear friction, Table 17.6.5.4 for limits on shear friction, and Table 17.7.5.2 for horizontal shear strength in composite flexural members). Sub A	

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					and Sub E need to work together on this – but after Chapter 17 is approved.	
338	Wyllie	213	N	T	Again, why the “shall be indicated”? there is no lead-in in 23.4.7 to include anything in the CDs.	
339	Frosch	214	C	T	Insert comma before “and”	
340	Wyllie	215	N	T	Where is old 6.4.6 which should be in this list?	
341	Wyllie	215	N	T	Where is old 6.4.7 which should be in this list?	
342	Becker	216	N	T	I think this is a pretty substantive change. The current provision is about composite steel beams. As proposed, it is universally anywhere shear is transferred. The “Steel” could be interpreted as any kind of steel. I cannot find that the steel manual limits coatings on the steel, but I also cannot find something that says that a galvanized surface is ok for the shear transfer mechanism. This either requires justification or it should revert to current language.	
343	Gustafson	216	C	T	Would prefer wording similar to 11.6.10 in 318-11, i.e.: “Where shear is transferred between as-rolled steel and concrete using headed studs or welded reinforcing bars, steel shall be free of paint, oil, grease, or loose material, with the exception of hot-dipped galvanizing.”	
344	Klein	216	C	T	Consider listing concrete overspill from adjacent placements.	
345	Seguirant	216	N	T	Go back to the current wording of <11.6.10>. The revised provision does not say the same thing as ACI 318-11.	
346	Weiss	216	C	T	Free is absolute	
347	Wyllie	216	N	T	Use the old words of 11.6.10. this is a significant change. Galvanized surfaces can be covered with mud, oil and grease? That is what it says.	
348	Corley	217	N	T	The exception allows galvanized bars to have paint, oil, grease and loose material on them. What was Sub. A thinking?	
349	Fiorato	217	N	T	Delete the phrase “with the exception of hot dipped galvanizing.” There should be no confusion, as galvanizing is not “painting.” For the future, this seems like ACI 301 material, not ACI 318 material.	
350	Kelly	217	N	T	“with the exception of hot-dipped galvanizing” is unnecessary.	
354	Becker	220	N	T	Wow! This is a huge change. The current provision is a simple requirement that is easy to interpret and apply. As proposed, this places a huge burden on the LDP and contractor. The LDP has to speculate on construction sequence and timing to even get an idea of loads that would be imposed for determining a minimum required strength. How then are the assumptions communicated so the contractor knows to build according to those assumptions?	

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					From the contractor's side, how many additional cylinders must be made and tested to confirm that the minimum specified strength has been achieved? How would the schedule be affected if the strength is not reached? This needs to go back to current language.	
355	Carino	220	C	T	Revise for clarity: "Indicate the required in-place strength of vertical support members before beams..."	
356	Corley	220	C	T	Strike "which" and insert "required" after "strength".	
358	Kopczynski	220	C	T	Change to "Indicate the required strength of vertical support members before beams, girders, and slabs supported by them can be cast or erected."	
359	Parra	220	N	T	New wording is incompatible with 23.4.3(g). Consider the following: "Beams, girders, or slabs supported by columns or walls shall not be cast or erected until concrete in the vertical support members achieves minimum strength indicated in construction documents."	
360	Rogowsky	220	N	T	Please retain the current wording. You have changed the meaning and created a potential construction problem. When with horizontal members (beams or slabs) are placed in the same pour as the supporting vertical member (column or wall) you need to allow the concrete in the vertical member to go through it's plastic settlement before you place the concrete in the horizontal members. If you do not, you will develop plastic settlement cracks when the concrete in the vertical member settles and moves away from the horizontal member concrete which is held in position by the horizontal formwork. There is no specific need of a minimum strength in the vertical member.	
361	Schaeffer	220	N	T	It is not practical for a typical set of CDs to indicate the minimum strength of different members during construction. Suggest rewording to say " <i>If less than the 28 day specified compressive strength indicate the minimum strength of</i> "	
362	Seguirant	220	C	T	Shouldn't this be " <i>minimum in-place strength</i> "?	
363	Wight	220	C	T	Add "required" before "minimum strength" and delete "which".	
364	Wood	220	N	T	This seems to be a significant technical change. Does the LDP know enough about the concrete to specify the minimum strength at which the floor concrete can be placed? Won't this require a large number of additional cylinders to be cast?	
365	Wyllie	220	N	T	This is a major change. It is normal to delay a slab pour for 2 hours or so after the wall pour. This calls for strength tests. Engineers and contractors have understood "no longer plastic"	

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					for many years. Keep existing words.	
366	Becker	224	N	T	I think the original language was better rather than saying when something should not be done.	
367	Carino	224	N	T	I don't think we have captured the intent of the current 6.4.7. Currently, the default is to require monolithic construction. So we have to place this in the construction documents. Revise as follows: "Indicate if beams, girders, haunches, drop panels, shear caps, and capitals are required to be placed monolithically as part of a slab system." If there is no requirement, then the contractor is free to exercise the options of placing these things monolithically or not. The Commentary should indicate that the default of the Code is monolithic construction of these elements.	
368	Corley	224	N	T	Stick with original wording. Emphasize that "monolithic" is first choice.	
369	French	224	C	T	Change "when" to "where"	
370	Jirsa	224	N	T	Original is better statement. The change is confusing—does "when" refer to location or sequence of placement?	
371	Parra	224	N	T	New wording is incompatible with 23.4.3(g). Revert to previous wording.	
372	Rogowsky	224	C	T	New wording is awkward. Please clarify intent of the provision in the commentary.	
373	Seguirant	224	N	T	The current Code indicates that beams, haunches, etc. are to be placed monolithically with the slab unless otherwise approved by the LDP. The rewording says to indicate when it is <u>not</u> permissible to place them monolithically. This is not correct. My interpretation is that it is <u>always</u> permissible to place them monolithically, and that they can be placed separately only when approved by the LDP.	
374	Wood	224	C	T	"When" should be "where" or "if."	
375	Wood	224	N	T	This comment refers to my comment on line 154. For situations where the column concrete is puddled in the joint region, this provision is not very clear. My guess is that the provision applies to other situation as well. Please provide more information about the intent of the provision.	
376	Wyllie	224	N	T	No. Nothing to indicate. Do not do it! That is what the code says.	
377	Carino	227	C	T	Doesn't read right. Should it be: "Indicate the location of composite topping slabs to be cast in place on a precast floor or roof that are intended to act structurally with the precast members."	
378	Corley	227	N	T	Original thought is completely lost. It should say "shall be permitted" somewhere.	
379	French	227	C	T	Change to "Indicate <u>where</u> composite topping"	

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					slabs <u>are</u> to be cast...with the precast members are located . Requirements of 23.4.7(h) shall apply."	
380	Jirsa	227	N	T	Sentence does read properly. Suggest "Indicate <u>location</u> of composite.." and delete "are located" at end of sentence.	
381	Kopczynski	227	C	T	Add "where" after "Indicate"	
382	Seguirant	227	N	T	I don't understand what this provision is trying to accomplish. First, there is no " <i>where</i> " in the sentence to accompany " <i>are located</i> ". Even if there were, the provision provides no requirement as to how the composite topping should be constructed so that it acts as intended.	
383	Wight	227	C	T	This sentence is a mess. I suggest, "Indicate where composite topping slabs, which are cast-in-place on a precast floor or roof, are intended to act structurally with the precast members."	
384	Wyllie	227	N	T	Delete the indicate. Makes no sense. This is a seismic design provision and the intent of the design clearly needs to be shown on CDs.	
385	Fiorato	228	N	T	What does the contractor do with this information? Also, do we need to say "23.4.7(h) shall apply."? Why would it not apply?	
386	Becker	229	N	T	Delete "23.4.7(h) shall apply." There is a case where no intentional roughening is required if minimum horizontal shear ties are provided. See <17.5.3.2>	
387	Frosch	229	C	T	23.4.7(i) should also apply.	
388	Becker	230	C	T	Someone had something specific in mind when this provision was added. Perhaps it could get more specific. "...high horizontal shear..." What is high? Does the "...and seismic resistance..." go with the high horizontal shear or is it a separate trigger?	
389	Carino	230	N	T	What does the word "special" refer to?. What is the meaning of "high horizontal shear force"? It is not clear what kind of information the LDP is expected to include in the documents other than drawings of the elements. Which Code provision is being addressed by this?	
390	Klein	230	N	T	It would seem to me that <u>any</u> details or other special requirements that go beyond the requirements of 318 and the project specifications should be shown in detail and located. Why single out high horizontal shear forces and designs involving seismic resistance. How high is high?	
391	Schaeffer	230	N	T	This provision is too vague and not defined. It could require that almost everything is detailed. For instance, how much is " <i>high</i> ". Suggest moving this to the Commentary.	
392	Wight	230	N	T	This sentence is a mess and I do not know what you are trying to achieve with it. What is the	

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					definition of high? Why only horizontal shear forces? What about high vertical shear forces? Are you intending this section for a specific member? I would attempt to correct this sentence, but I do not know what you are trying to say.	
393	Wood	230	C	T	What are "high horizontal shear forces?" How would "high" be distinguished from "low" and "moderate?"	
394	Wood	230	N	T	The reference to "seismic resistance" seems quite vague. Please clarify the intent of this provision.	
395	Wyllie	230	N	T	This appears to be a new provision and I am not sure what this means. High horizontal shear forces are common in seismic design and the LDP should address. I suggest this provision be deleted since it is not in old code.	
396	French	231	C	T	What is meant by "high" horizontal shear forces? Words "and seismic resistance" seem out of place in the clause. Delete "and located"	
397	Gustafson	231	C	T	Replace "seismic" with "earthquake".	
398	Corley	232	N	T	Not clear what "located" means. Do you mean "located on construction documents"?	
399	Gerber	232	C	T	This seems to be an incomplete sentence. I have no suggested fix.	
400	Parra	232	C	T	What does "and located" mean?	
402	Carino	237	C	T	I suggest making the second sentence a separate provision because it addresses a different requirement than the first.	
403	Corley	237	C	T	Make second sentence a separate requirement.	
404	Gerber	237	C	T	Reference to manufacturer's mill certificate is obscure to me. Don't we want <u>certified mill test reports</u> like the IBC calls for?	
405	Parra	237	C	T	Consider rearranging second sentence as follows: "Submittal of the manufacturer's mill certificate shall be required."	
406	Rogowsky	237	N	T	Delete "strength or". It is necessary and sufficient to specify the grade. Among other things, without knowing the grade, how do you distinguish between weldable and non-weldable rebar?	
407	Seguirant	237	C	T	Why is <u>specified</u> underlined – it is part of the current Code?	
408	Wight	237	C	T	Change second sentence to, "Submittal of manufacturer's mill certificate is required."	
409	Wood	237	C	T	The second sentence is not grammatically consistent with the first.	
410	Wyllie	237	N	T	How about the ASTM?	
415	French	241	N	T	Add	

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					(c) Requirements for type, size, location, and installation of anchors; and qualifications for post-installed anchor installers as required by 19.8. <318-11 1.2.1f>	
416	Seguirant	242	C	T	Replace <12.14.1> with <1.2.1i>. This is the current provision that requires it be shown on contract documents.	
417	Gustafson	243	C	T	Guidance on "Type" should be provided in the Commentary.	
418	Seguirant	243	C	T	Replace <12.14.1> with <1.2.1j>. This is the current provision that requires it be shown on contract documents.	
419	Seguirant	243	C	T	Replace current Code references with <1.2.1j>. This is the current provision that requires it be shown on contract documents.	
420	Rogowsky	246	C	T	Suggest deleting "nonprestressed". This will make the clause more general to accommodate things like epoxy coated strand.	
421	Seguirant	246	C	T	Why would this apply only to nonprestressed reinforcement? What if the LDP wants to specify coated strand?	
422	Becker	249	N	T	This is not about reinforcement and should be deleted. It is covered in 23.6.2.	
423	Browning	249	C	T	Item 23.5.1(i) is repeated 23.6.2(k) – strike it here, or change "steel" to "reinforcing" in line 250 and leave it in both places	
424	Carino	249	C	T	Should it be "embedments"?	
425	Parra	249	C	T	This section is already in 23.6.2(k), which is a more appropriate location.	
426	Seguirant	249	N	T	Delete this provision, it is covered under embedments.	
427	Carino	251	N	T	I do not see why this was added. The LDP does not need the fiber properties to permit the use of FRC as an alternative to reduce transverse reinforcement. The fibers are required to meet the ASTM specification and the fiber-reinforced concrete is required to meet the residual strength criteria.	
428	Frosch	251	C	T	Is there a reason using <new> instead of <~>?	
429	Wyllie	251	N	T	Why not details for headed bars and spacing of such bars?	
433	Schaeffer	252	N	T	Most Construction Documents will reference 301 which in turn references 117 for Tolerances. Suggest replacing this section with a requirement that the CDs reference 301.	
434	Corley	253	C	T	Why can't we adopt ACI 117 and only list exceptions? Engineers are held to 117 whether they specify it or not.	
435	Frosch	253	N	T	The wording of this sentence is confusing. Please rewording similar to 318-11. "Tolerance for d and specified c_c shall be in accordance with ..."	

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436	Parra	253	C	T	Add "shall be" after " c_c ". Also, consider deleting "location of reinforcement with consideration of".	
437	Seguirant	253	N	T	The wording of the current Code is much clearer, " <i>Tolerances for d and c_c in flexural members, walls, and compression members shall be in accordance with Table 23.5.2(a).</i> "	
438	Wood	253	C	T	d is used throughout 318 and does not need to be defined. However, please provide a short definition of c_c .	
439	Carino	255	C	T	The Commentary should explain the meaning of a negative value for the tolerances.	
440	Gustafson	255	C	T	The notation " c_c " is already used for "clear cover of reinforcement". See Chapter 2, Line 156. Thus, another notation is required for "specified concrete cover". Suggest replacing " c_c " in Line 255 and in three places in Table 23.5.2(a) with the notation " c_s ". Also add " c_s " to Chapter 2.	
441	Frosch	257	N	T	The current wording is confusing. Suggest the following: Reword as "reinforcement <u>shall be</u> in accordance with Table 23.5.2(b). The tolerance for c_c in Table 23.5.2(a) shall apply at discontinuous ends of members."	
442	Parra	257	C	T	Add "shall be" after "ends of reinforcement".	
443	Seguirant	257	N	T	The wording is not clear. Suggest " <i>Tolerance for longitudinal location of bends and ends of reinforcement shall be in accordance with Table 23.4.2(b), and in accordance with Table 23.5.2(a) for concrete cover at discontinuous ends of members.</i> "	
444	Becker	258	C	T	23.4.2(b) should be 23.5.2(b)	
445	Frosch	258	C	T	Correct table numbers in both lines 258 and 259.	
450	Carino	260	C	T	I don't understand the need for the word "discontinuous". Doesn't an "end" have to be discontinuous; otherwise, it's not an end. The Commentary needs to explain why this word is used and what it means.	
451	Carino	262	N	T	There is no section 21.5.6.3.	
452	Frosch	262	C	T	Add " <u>shall be</u> in accordance".	
453	Parra	262	C	T	Add "shall be" after "splices".	
454	Seguirant	262	N	T	Add " <i>shall be</i> " after " <i>splices</i> ".	
455	Wyllie	262	N	T	This is a specification, not a tolerance. This does not belong here.	
459	Anderson	264	C	T	I realize this is existing Code language; yet I suggest adding "loose," as the concern is really with loose rust or mill scale. A tight rust pack usually enhances bond. "(a) Nonprestressed reinforcement with <u>loose</u> rust, mill scale, or a combination . . ."	

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460	Carino	264	N	T	This provision could be interpreted to mean that the mill scale has to be removed if the bars are not in compliance with the ASTM requirements. Is this practicable? Mill scale is beneficial as a protective layer before concrete is cast around the reinforcement.	
461	Seguirant	264	N	T	This provision has nothing to do with placement of the reinforcement. Also, the rewording of the exiting provision is unacceptable. What happens if the reinforcement can't be " <i>brought to an acceptable condition</i> "? Use the existing provision and move it where it makes sense, such as under reinforcement materials.	
462	Carino	268	N	T	The word "thoroughly" is not needed. The requirement that the reinforcement be "clean" is sufficient. If "thoroughly clean" is used how does the inspector evaluate the thoroughness of the cleaning?	
463	Gustafson	268	C	T	Delete "thoroughly".	
464	Seguirant	268	N	T	This provision has nothing to do with placement of the reinforcement. Move it where it makes sense, such as under reinforcement materials. Also, why would this apply only to nonprestressed reinforcement?	
465	Weiss	268	C	T	Appears slightly different than what is noted earlier	
466	Wyllie	268	N	T	We dealt with ice in 23.4.5. "Free of" is better than "thoroughly clean of". Use words old 7.4.1. This provision disallows epoxy coated bars, as that is a coating that decreases bond.	
467	French	269	N	T	Add" " <u>Epoxy-coating of reinforcement in accordance with 6.11.2 shall be permitted.</u> "	
468	Seguirant	271	N	T	This provision has nothing to do with placement of the reinforcement. My understanding is that, where possible, provisions are to stick with one thought. This revised provision combines several provisions from the current Code. These provisions should be moved to a new section " <i>Bending of reinforcement</i> " and separated using the current Code language.	
469	Wyllie	271	N	T	Go back to old wording with the LDP provision. Last sentence makes no sense. Indicate? Where? No reference to CDs.	
470	Corley	272	N	T	Second sentence is a separate requirement. It needs a section number.	
471	Gustafson	272	C	T	Replace "installation" with "placement". The term "placement" appears in Line 273 and "placing" appears in Line 280.	
472	Rogowsky	272	N	T	For constructability, the field bending of reinforcement that is partially embedded in concrete is frequently done and an outright prohibition is problematic. Suggest revising the wording to read "Field bending of reinforcement partially embedded in concrete shall not be	

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					permitted without the approval of the licensed design professional.”	
473	Carino	273	C	T	I believe “if” should be used rather than “when” because we are referring to conditions rather than time.	
474	Corley	273	N	T	“Offset bars, etc.” is a separate requirement.	
475	Corley	275	C	T	Strike “against” and insert “to prevent”. Strike “within” and insert “beyond”.	
476	Wyllie	275	N	T	Use full wording of old 7.5.1. The author has thrown out many good and important thoughts.	
477	Becker	279	N	T	Delete “continuous bar or wire, evenly spaced,”. That is covered in 21.8.3.1 which is a better place.	
478	Carino	279	N	T	I still feel that this provision is not clear. The contractor is required to place the spirals within tolerance, so what are we trying to tell the contractor in this provision? What would be lost if this provisions were to be deleted?	
479	Wyllie	279	N	T	Use words of existing 7.10.4.1. The phrase without distortion is important.	
482	Wyllie	284	N	T	The underlined addition sounds like Commentary.	
483	Corley	285	C	T	I like intent but is this enforceable?	
484	French	287	N	T	Sounds odd to say something is not permitted and then in next sentence to say authorize when permitted. Change to: “Welding of crossing bars shall not be permitted for assembly of reinforcement unless authorized by the licensed design professional.”	
485	Kopczynski	287	C	T	Remove “Authorize when this is permitted.” Add to end of first sentence “reinforcement, unless otherwise permitted by the licensed design professional.”	
486	Parra	287	C	T	Consider following wording: “Welding of crossing bars shall not be permitted for assembly of reinforcement unless specified otherwise.”	
487	Wight	287	N	T	This reads like an instruction (to somebody), not a requirement. Should this be, “The LDP will authorize when this is permitted.”?	
488	Wyllie	287	N	T	Use existing words. “Authorize when this is permitted” is terrible code language after we say it is not permitted. Sounds like nothing is the code is required. Go back to the LDP words.	
489	Corley	288	N	T	Strike line 288. Insert “unless authorized by the licensed design professional”.	
490	Fiorato	288	N	T	Need to state who authorizes the welding – LDP?	
491	Wood	288	C	T	The second sentence of this provision is not grammatically consistent with the first.	

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492	French	291	N	T	<p>Add a separate section for anchoring to concrete:</p> <p><u>"23.6 – Anchors</u></p> <p><u>23.6.1 Anchor information to be specified in construction documents shall include (a) through (##) as applicable."</u></p> <p><u>(a) Size, type, location and installation requirements for anchors. <1.2.1(f)></u></p> <p><u>(b) Required qualifications for post-installed anchor installers. <1.2.1(f)></u></p> <p><u>(c) Requirement that exposed anchors intended for bonding with future extensions be protected from corrosion."</u></p> <p>Also can move the appropriate info from Chapter 19 to Chapter 23.</p> <p>Re-number Section 23.6 to 23.7-Embedments and rest of Chapter 23.</p>	
493	Frosch	291	C	T	Suggest changing title to "Embedments and Anchors"	
494	Schaeffer	294	N	T	<1.2.1 (e) > actually states "Size and location of all structural elements and reinforcement"; it does not reference embedments. Using the term embedments could refer to embedments not designed by the LDP, such as for precast, curtainwall, etc. It could possibly be clarified by referring to them as " <i>embedments designed by the LDP</i> "	
495	Wyllie	294	N	T	This is not really part of old 1.2.1 (e). In the list, details must be added.	
496	French	295	N	T	Delete lines 295-296 (they have been relocated in separate anchor section) Also need to change line 292 to say "(a) <u>and (b) through (d)</u> "	
497	Gerber	296	C	T	In 318-11 Section 1.2.1, it actually stated the code Section (D9) detailing the qualifications. Should we do the same here?	
498	Rogowsky	296	C	T	This provision is out of place. Post-installed anchors are not embedments.	
499	French	297	C	T	Change to: "(b) Requirement that exposed embedments and anchors intended for bonding with future extensions be protected...."	
500	Frosch	297	N	T	This requirement doesn't fit in this list. Consider adding below in the construction requirements section and word similar to 318-11. This fits well before or after item (k).	
501	Wyllie	297	N	T	This is the same as 23.5.1 (h). We do not need to say it twice.	
504	French	299	C	T	Change to: "Embedment construction requirements to be	

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					included in contract documents include (a) through (m) as applicable.”	
507	Wyllie	299	N	T	The order of this section does not flow well. The old 6.3 went much better. Suggest you just copy old 6.3 as new 23.6.2.	
508	Carino	300	C	T	I assume that the “embedments” here are those that the contractor places for the purpose of construction rather than those the LDP has designed. I think this provision needs to be made clearer, because the LDP is responsible for the design of embedments needed for the structural design.	
509	Carino	303	C	T	The Commentary needs to explain the intent of the words “considered to structurally replace”.	
510	French	304	C	T	It seems like (e) starting on line 320 should be relocated to follow (b).	
512	Carino	309	N	T	I have difficulty in interpreting the meaning of “or which is required for fire protection.” Does it mean the conduits cannot displace any of the concrete required for fire protection or not more than 4% of the area required for fire protection? Commentary might help.	
513	French	310	C	T	The diameter and spacing are combined in line 310, but in lines 317 and 319 they are separate. It seems that these sections should be formatted similarly.	
514	Fiorato	312	N	T	Suggest revising to “Except when drawings for <u>size and location of conduits and pipes...</u> ”	
515	Wood	312	C	T	Perhaps this could be revised to make the intent clearer. “The licensed design professional shall approve drawings for conduits and pipes embedded in concrete structures unless (i) or (ii) is satisfied: (i) Conduit or pipe passes through the thickness of a slab or wall or through the width or height of a beam. (ii) Outside dimension of conduit or pipe shall not exceed one-third of the overall member thickness and center-to-center spacing shall be at least three diameters or widths.” It does seem odd to list the responsibilities of the LDP in this chapter on construction documents.	
516	Parra	314	N	T	I don’t think we should allow pipes to go through the “height of a beam” unless specified by the LDP.	
517	Sanders	315	N	T	Change “shall” to “that”	
518	French	317	C	T	Don’t the requirements of 317 also apply to ©?	
521	Wood	320	C	T	Is this section referenced in the column chapter? It seems out of place here.	
522	Carino	323	N	T	I reiterate my comment on the previous ballot: Does this requirement mean that the water in cooling pipes used for thermal control has to	

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					be below 90 F? This would seem to prohibit the use of water cooling pipes in mass concrete if the concrete temperature gets so high that it raises the cooling water to above 90 F. An exception has to be made for piping used for thermal control.	
523	French	323	C	T	It seems like (f) should follow (g)	
524	Wood	323	C	T	"nor" is used incorrectly in this provision. It should be "or."	
525	French	328	C	T	It seems like (h) should follow (e)	
530	Gustafson	333	C	T	Sorry. I am confused by "outside dimension of the conduits or pipes parallel to the slab thickness".	
531	Jirsa	333	N	T	Original statement is better. Reword and remove ""parallel to the slab thickness."	
532	Carino	334	C	T	The words "parallel to the slab thickness" implies pipes that are perpendicular to the surfaces of the slab. Is this what we mean, or is the intent to refer to pipes parallel to the surfaces of the slab or in the plane of the slab? Needs further clarification.	
533	Fiorato	334	N	T	Suggest revising to "...conduits or pipes within the slab thickness..."	
534	Frosch	334	C	T	Why are we changing this from 1 in? I suspect that this might cause a problem in these types of slabs as they can be thin. I would like to know if practitioners feel this will work. Consider retaining 1 in. here.	
535	Wyllie	334	N	T	This is New Business needing a separate ballot. Not a bad idea, but a change.	
536	Frosch	337	C	T	What is 23.6.2.8? It is not here. Is this (h)?	
537	Browning	338	C	T	If 23.5.1(i) is struck, add "including reinforcing" at the end of line 339	
538	Carino	338	N	T	Already covered in Line 249.	
539	French	338	C	T	It seems like (k) should follow (m)	
540	Wood	339	C	T	I think that "or" should be "and." The intent is to prevent both types of deterioration.	
541	Wood	341	N	T	If all reinforcement has to be shown on the drawings, this provision seems to be in the wrong place.	
542	Frosch	342	C	T	Change "normal" to "perpendicular". We have been making this change throughout the code.	
543	Gustafson	342	C	T	Replace "normal" with "perpendicular".	
544	Anderson	343	C	T	I am confused. Item (m) seems to be speaking to the LDP and it is acceptable. Aren't we speaking to the LDP in this chapter?	
545	Becker	343	Y	T		
546	Browning	343	Y	T	Good practice dictates this requirement and other potential conflicts with other design discipline's installation needs to be coordinated by the LDP during the design process	

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547	Fiorato	343	Y	T	Agree that 23.6.2(m) should be deleted. This should be covered in the materials specifications for the pipes and fittings.	
548	Rogowsky	343	C	T	I have worked on a number of artificial ice surfaces and the brine pipes are sometimes damaged during concrete. The contractors will maintain a small internal air pressure in the piping system and if piping system is damaged leaks are evident when you finish the concrete. The concrete will have personnel and equipment on hand to remove the concrete, repair the pipe, and replace the concrete before it sets up. I suggest that you consider for the commentary to this provision.	
549	Alcocer	345	Y	T		
550	Bondy	345	Y	T	I agree with the statement in the yellow box.	
551	Cagley	345	N	T	Perhaps 23.6.2(m) needs to be reworded or relocated to become a note of caution, but it shouldn't be eliminated. It has been in the code for sometime.	
552	Frosch	345	Y	T	Agree. This is something for the mechanical engineer.	
553	Gustafson	345	Y	T		
554	Jirsa	345	Y	T	Delete entirely.	
555	Mlakar	345	Y	T	Move to items the Code does not govern	
556	Novak	345	Y	T	Move to 1.4.x	
557	Parra	345	C	T	I agree that item (m) may not belong here. However, I think it is needed, at least in the commentary. Maybe adding it to the commentary at the beginning of Section 23.6 would serve the purpose.	
558	Sanders	345	C	T	Yes	
559	Wood	345	C	T	I agree that the 23.6.2(m) does not belong here. I do not know the correct location.	
560	Wyllie	345	N	T	I disagree. The Contractor can control this, as he hires the plumbing and other subs who provide these pipes and he can make sure they are properly designed.	
561	Corley	347	N	T	This should not be deleted. Moving to Chapter 1 would be okay.	
562	French	347	Y	T		
563	Rabbat	347	C	T	It is not clear if voting Y means deleting this section or moving Item (m) to Chapter 1. I do not think Item (m) should be deleted. Placing it in Chapter 1 is not the solution. Since pipes and fittings need to be designed and can be used in different members, this item belongs in the design tool box in addition to Chapter 1.	
566	Carino	353	N	T	The "specified strength" is what is used as the basis for acceptance of concrete. The strength required at different stages of construction	

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					should the "the in-place strength required at stated stages of construction".	
567	French	353	C	T	Is very similar to line 384	
574	Corley	366	C	T	Logic would suggest it would be better to prohibit unless "approved".	
575	Frosch	368	C	T	Consider rewording to "embedded while the concrete is fresh". As currently worded, it is not clear that this is allowing for embedments inserted after placement.	
576	Rogowsky	370	N	T	Please maintain the current wording. "Fresh" concrete does not mean anything. Is it one hour old, or four hours old? I have seen people <u>pound</u> dowels and anchor bolts into concrete after it has begun to set up. Requiring the concrete to be in a plastic state is more appropriate. (I also wonder how much bond you can rely on when an item is placed in concrete without subsequent re-vibration, and why this is allowed for precast concrete but not cast-in-place concrete. I realize that these are issues for the next code cycle.)	
577	Carino	380	N	T	As was stated in my comment to line 351, the LDP is responsible for indicating in the construction documents what information needs to be supplied on the shop drawings. That is not the same as "construction documents or shop drawings shall specify."	
578	French	380	C	T	"Shop drawings" should be considered as part of the "construction documents" Also rearrange the sentence to indicate: "Prestressed concrete information to be included in contract documents should include (a) through (c) as applicable."	
579	Kopczynski	382	N	T	Change to "Magnitude and location of prestressing forces or tendons." Some office show required forces in their design drawings; others show tendons. Both should be permitted.	
580	Wood	383	N	T	(b) seems to apply only to post-tensioned concrete. The strands in prestressed concrete are stressed before the concrete is placed. Why does the LDP need to specify the stressing sequence? <18.3.4.3> applied only to post-tensioned tendons.	
581	Anderson	384	C	T	In (a) above (Line 382), we reference prestressing <u>forces</u> . Shouldn't we be consistent with terminology in (c) also? (c) Minimum in-place concrete compressive strength at time prestress <u>force</u> is transferred into member.	
582	Frosch	384	N	T	Delete "in-place". Field cured concrete cylinders are commonly used for this purpose. I have not commonly seen temperature-matched	

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					cured. In-place does not seem appropriate unless we make clear in the commentary that this includes field cured cylinders. If that is the case, I am fine with in-place.	
583	Rabbat	384	C	T	Delete "in-place." Historically, post-tensioners have relied on cylinders.	
584	Wood	384	N	T	The addition of "in-place" seems to apply only to post-tensioned concrete. Why not use the terminology that is consistent with both prestressed and post-tensioned members? f'_{ci} corresponds to "specified compressive strength of concrete at time of initial prestress." 18.13.4.3 in 318-08 stipulates minimum values of f'_{ci} for post-tensioned concrete.	
589	Wood	391	N	T	18.6.2.1 in 318-11 states that "the required effective prestress force shall be indicated in the contract documents." Is this requirement referenced in Chapter 23?	
590	Alcocer	392	N	T	Please include free of ice, too.	
591	Frosch	392	C	T	Insert comma after "pitting"	
592	Weiss	398	C	T	Maybe this is intentional however properties is quite vague	
599	Wyllie	402	N	T	Use the words of old 18.20.1 (a). The average load-elongation curves is different from E_p which is a linear relationship.	
600	Wyllie	404	N	T	Why different from 18.20.1 (b)? These new words not clear that dynamometer must be calibrated.	
605	Rogowsky	406	N	T	First, the section references are wrong. 23.8.2.4 (a) and (b) do not exist. More importantly, I believe that the discrepancies to which the percentages apply are between the measured and predicted elongations. You typically jack to the prescribed force and measure the elongation. There are rare cases where you jack to a prescribed elongation and measure the force, but if you are expert enough to do this, you do not need 318 to tell you what discrepancies need to be investigated and corrected.	
611	Cleland	409	N	T	The provision is unclear as to what "total prestress" is to be used for comparison. Is this one beam, one bay of slab, or the entire floor?	
612	Rogowsky	410	C	T	The licensed design professional should be allowed to investigate and determine if losses in excess of 2 percent are acceptable. (This is not consistent with allowing the elongations to 5% to 7% shorter than predicted.)	
613	Cleland	411	N	T	Prestressing is not usually anchored to bulkheads, which are form dividers within the forms. The proper term here should be "pulling heads" or more generally "anchorage"	
614	French	411	C	T	Change to "of <u>the</u> pretensioning bed..."	

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615	Wyllie	411	N	T	See box. I have no objection but this is a Technical Change needing separate ballot. I believe "undesired temporary stresses" is just as unenforceable as "minimize shock to the concrete".	
616	Fiorato	412	C	T	Will the contractor have the information to meet this requirement?	
617	Alcocer	413	N	T	The original wording calls for "minimize". New wording implies zero temporary stresses because word used is "prevent". I suggest to go back to "minimize" which is realistic.	
618	Frosch	420	N	T	The way that this is worded, no matter what is in the contract documents, if 2500 psi is achieved for single-strand tendons, it is fine to stress. Is this the intent. Seems that by combining these items, there is a problem. This provision should be reworded. Suggest rewording as follows: "Prestressing reinforcement shall not be stressed until concrete compressive strength is at least 2500 psi for single-strand or bar tendons, 4000 psi for multistrand tendons, or a higher value is specified by the licensed design professional."	
619	Frosch	420	N	T	Again, I have concern about the wording "in-place". See previous comment on line 384.	
620	Corley	421	N	T	This is confusing. Are 4000psi and 2500psi intended to overrule LDP specified strength or used only if LDP is silent? Can LDP be silent? Clarify!	
621	French	421	N	T	It seems that this section should be combined with 23.8.1(c) It also seems that this section should be combined with (i) with wording such as: "...bar tendons <u>unless in accordance with 23.8.1(i).</u> "	
622	Jirsa	421	C	T	Move "in 23.8.1(c)" after "specified" in line 420	
623	Kopczynski	421	N	T	Change 2500 psi to 2800 psi. The LDP can always specify something lower. In the absence of that, 2500 psi is too low as a default number; compressive stresses during stressing for ½" dia 270 ksi tendons, based on standard anchors of 2.25" x 5", exceed 2500 psi.	
624	Wyllie	422	N	T	This is New Business requiring a separate ballot. Please provide a copy for review. We had to add "Grout" to the title of Chapter 22 and now we are deleting all our requirements? Seems we should keep some control. This would then become a referenced document.	
625	Corley	430	N	T	Unclear! What part is to be overruled, 4000, 2500 or specified? Strike "need" and insert "shall".	

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626	Jirsa	430	C	T	Replace "need" with "do"	
627	Carino	436	C	T	How will this requirement be transferred to the construction documents? I think the requirement should be to specify in words in the contract documents the protection requirements in 6.8.3. We don't want the contractor to have to go to ACI 318 to find the requirements.	
628	Wood	436	C	T	Protected from what? Corrosion?	
629	Frosch	437	C	T	Insert comma after "couplers"	
630	Wood	437	C	T	Does (k) refer to protection during construction or permanent protection?	
631	Wood	439	C	T	Does (l) refer to protection during construction or permanent protection?	
632	Carino	440	C	T	Should we use "submitted" instead of "provided."	
633	Corley	440	C	T	Make separate requirement, i.e. "(m) Details of corrosion protection system shall be provided."	
635	Carino	442	N	T	Revise to: "Construction documents shall specify that grout for post-tensioned members shall comply with PTI M55.1-12." Do not give the title here, but add the document to Chapter 3.	
636	Fiorato	442	C	T	Can PTI M55.1-12 be made available for ACI 318 review?	
637	Anderson	443	C	T	It seems as if there is too much reference type material in this clause, and some of it should be in the cited references. Staff to verify.	
638	Rabbat	443	C	T	Add a note, and the complete citation to be inserted in Chapter 3.	
641	Fiorato	455	C	T	Somehow it is comforting to know that the word "snugly" has made it into ACI 318.	
642	Wyllie	455	N	T	This makes no sense. Shores placed ... deflect and support its own weight and construction loads (wow!) prior to installation of the reshore?? Can't this be stated more clearly?	
643	Carino	460	C	T	Remove capital letter on "a".	
644	Seguirant	460	N	T	What about construction loads as in the current Code? Also, wouldn't these be "reshores" if they are used to support a recently built structure that had not developed its full design strength?	
645	Wyllie	460	N	T	A shore is lots of other things in construction.	
649	Carino	473	C	T	Delete the word "sufficiently" because it is not needed and the meaning is open to interpretation.	
650	Seguirant	473	N	T	The current Code language " <i>prevent leakage of mortar</i> " is understandably impractical, but " <i>control leakage of mortar</i> " is too permissive. It can be controlled at a very high rate, which is unacceptable. Suggest " <i>inhibit leakage of mortar</i> ".	
651	Jirsa	475	C	T	Reword "Formwork shall be designed so that previously constructed members are not	

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					damaged.”	
652	Becker	480	N	T	“if” needs to be “that” since the design is based on shored construction.	
653	Cleland	480	C	T	Replace “if” with “that”	
654	Corley	480	C	T	Strike “if” and insert “what”.	
655	French	480	C	T	Delete “if” – not necessary	
656	Frosch	480	N	T	This isn’t a performance requirement and doesn’t flow with items (a) through (e). This item needs to be relocated.	
657	Jirsa	480	N	T	This statement is no parallel with others in this group. Suggest moving it to 23.9.2.	
658	Parra	480	N	T	Wording in item (g) is not a “performance requirement”. I actually think this item can be deleted.	
659	Seguirant	480	N	T	This is out of place here. All of the other provisions, including the title, address formwork and this provision suddenly jumps to shoring of composite members. Also, the “ <i>indicate</i> ” makes it sound much different than the other provisions.	
660	Wight	480	N	T	Requirements (a) through (e) use the word “shall” and this one does not, making this statement inconsistent and unclear. Are you trying to say, “It shall be indicated that shoring is required for members when design is based on shoring during construction.”?	
661	Wood	480	C	T	(g) is not grammatically similar to the other provisions in this section.	
662	Wyllie	480	N	T	Indicate? No reference to CDs in this section. The present 9.5.5 complete should remain together for clarity.	
663	Seguirant	482	N	T	In the current Code many of these provisions address shoring, which has been replaced in this ballot by formwork. Is the basic premise now that formwork includes shoring? If so it should be made clear.	
664	Corley	483	N	T	Needs approval of “a licensed design professional”.	
667	French	493	C	T	Some of these provisions seem redundant. Line 493, 498-499, and 500-501.	
668	Weiss	493	C	T	I think that deformations also need to be mentioned for some cases but I will defer to those that do this. I think that this is especially important for fluid mixtures.	
669	Frosch	495	C	T	We may want to tie together the wording “in-place concrete strength” and use consistently. A definition may be useful if we want to use this phrase consistently in the code. What is needed – “field cured cylinders”, other methods.	
670	Carino	497	N	T	The approval of an alternative to field-cured cylinders should be by the LDP because the LDP has the knowledge of appropriate in-place	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
					test methods.	
671	Corley	505	C	T	It seems that the LDP should be the one to "indicate criteria". Do we mean "procedures for removal"?	
672	Frosch	505	C	T	The wording of this provision does not flow with the others. Consider rewording as in 318-11. Also consider typing 23.9.3(g) and 23.9.4(h) together better. Perhaps all that is needed is a section that indicates what the plans need to indicate and then the separate specification language.	
673	Parra	505	C	T	Consider following rewording to make it more compatible with other items in section: "For shored composite members, removal of shoring shall be performed according to criteria specified in construction documents. Criteria shall be stated..."	
674	Seguirant	505	C	T	The "indicate" makes it sound much different than the other provisions.	
675	Wight	505	N	T	Again, this seems like an instruction instead of a code requirement. I suggest changing the first sentence to, "For composite members, criteria shall be given for removal of shoring, when used."	
676	Wyllie	505	N	T	Indicate? No reference to CDs. State as positive thing.	
677	Carino	506	N	T	Change "design properties" to "in-place strength".	
678	Corley	506	C	T	I suggest strike "Criteria" and insert "Procedures" if contractor is responsible.	
679	Cleland	507	N	T	How can the contractor comply with "limits on deflections and cracking at time of shoring removal" without removing the shoring? This is not something in their control. Delete the part of the sentence after "loads".	
680	Frosch	507	C	T	Delete comma before "and"	
681	Frosch	510	C	T	It seems strange to have an (a) without anything else. It seems that something is missing.	
682	French	511	N	T	Might there be other loads besides the specified live loads including laterl load, etc.	
683	Seguirant	514	N	T	Where do these provisions say that "the inspector shall require compliance with construction documents" as in the current Code? Seems like a pretty important concept that should be included.	
685	Parra	515	N	T	This section needs some rewording. Some of the items in the list, such as "test reports" in item (a) or item (c), do not refer to actions inspected but to material in inspection reports. Consider the following: "Unless otherwise specified in the legally adopted general building code, the licensed design professional shall require concrete	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
					construction to be inspected throughout the various Work stages by a licensed design professional, by a qualified inspector, or by personnel under the supervision of the licensed design professional. Inspection records shall include: (a) Mixing, delivery..."	
686	Becker	516	C	T	Lacking any requirements for frequency, is it to be implied that this is continuous inspection? There is currently some commentary that suggests it is intermittent, but if the LDP is now supposed to put this in a specification, it seems like frequency ought to be addressed. To use the IBC term, should "periodically" be inserted before "inspected" in line 516?	
687	Corley	517	C	T	Strike "the various" and insert "each". Change "stages" to "stage".	
688	Frosch	517	N	T	The current wording is redundant. It says here "under the supervision of a LDP and in the last line "under the supervision of the LDP." Seems that this re worded as follows: "by the LDP, by a qualified inspector, or by personnel under the supervision of a LDP." Alternately, use the wording in 318-11.	
689	Wood	517	C	T	What is the difference between "under the supervision of a LDP" in line 517 and "by personnel under the supervision of a LDP" in line 519? This seems to be redundant.	
690	Becker	518	N	T	Delete "...or by personnel under the supervision of the licensed design professional". This is already covered in the previous line by "by or under".	
691	Cleland	518	N	T	"personnel under the supervision of the licensed design professional" is redundant with "under the supervision of a licensed design professional" and should be deleted.	
692	Seguirant	518	N	T	The added " <i>or by personnel under the supervision of the licensed design professional</i> " is not necessary as it is already covered earlier in the sentence.	
693	Carino	519	N	T	Avoid using "class" because it not defined. Each concrete mixture used in the Work is a "class" as far as the Code is concerned. For clarity, revise to: "Mixing, delivery, placement, and test reports for all concrete mixtures used in the Work documenting mixture proportions, quantity produced, placement location, and the results of tests of fresh and hardened concrete specimens:	
694	Frosch	520	N	T	With the way that this is phrased, what is needed to be done is not clear. In 318-11, it was clear that inspection records shall include delivery, placement, etc. Does mixing, delivery, placement, and test reports need to be inspected? Please reword.	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
695	Gustafson	529	C	T	Replace "anchors" with "embedments".	
696	French	533	N	T	The definition of tendon was changed to apply to PT situations and include the prestressing steel, duct, etc. In this context change "tendons" to "prestressing steel"	
697	Cagley	534	N	T	The statement used to say Any <u>significant</u> loadings.... It still should say that. I realize the difficulty in interpreting significant but this requirement needs some judgment to be applied.	
698	French	534	N	T	It seems odd to indicate that "any construction loadings" are to be inspected.	
699	Gustafson	534	C	T	Replace "loadings" with "loads". The term "loads" rather than "loadings" appears, for example, in Lines 468, 470, 509 and 510.	
700	French	536	N	T	"anchors" are absent in 23.10 (a)-(j) and should be included.	
701	Becker	537	C	T	I think this should be Chapter 20.	
702	Carino	537	C	T	I assume the "continuous inspection" is defined in the general building code.	
703	French	537	C	T	Should the reference be to Chapter 20 rather than Chapter 17? What about special walls? Don't they require inspection?	
704	Frosch	537	C	T	Assume this should be Chapter 20.	
705	Gerber	537	C	T	Lines 537-550. Sections 23.10.2 and 23.10.3 both require continuous inspection, but the details by which the inspector is selected differs. Section 23.10.2 leaves the selection to a licensed design professional, while Section 23.10.3 indicates the building official must approve the inspector. The provisions in 318-11 refer to a <u>special</u> inspector, yet Section 23.10.3 deleted the word <u>special</u> . I would request the word <u>special</u> be retained in Section 23.10.3 since the building official is involved and the IBC defined the need for continuous inspection as special inspection. With that said, perhaps Section 23.10.2 should be worded similarly to Section 23.10.3 with respect the inspector qualification as the reason for differences are not obvious here.	
711	Seguirant	539	N	T	The modifications to the last sentence make it very convoluted. Return to the language of the current Code.	
712	Becker	540	N	T	Where did the requirement come from that the inspector be a licensed design professional? I don't see anything in the IBC or 318-11 with this requirement. It should be deleted.	
713	Sanders	544	N	T	Add "The LDS shall specify that adhesive..."	
714	Corley	546	C	T	I would prefer to require an "inspector certified in inspection of adhesive anchors and	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
					specifically approved for that purpose by the building official.”	
715	Parra	547	C	T	Current wording implies that it is the inspector’s duty to provide a satisfactory report regardless of whether the installation was performed satisfactorily or not. This could be solved by adding the following after “an inspector specifically approved for that purpose by the building official.” “The installation shall be considered satisfactory when this inspector furnishes a report to the licensed...”	
716	Wood	548	C	T	Recommend using “if” rather than “that” in 23.10.3. The report should indicate that the work has not been completed if appropriate.	
717	Sanders	551	N	T	Add “The LDS shall specify that records...”	
718	Wood	551	C	T	The phrase “inspecting engineer or architect” does not seem to be consistent with the terms used in 23.10.2.	
719	Fiorato	552	C	T	Do we need to clarify the role of the “architect” in ACI 318. This provision is the only location in the body of the Code where the architect is assigned a responsibility.	
720	Corley	553	C	T	Assign to new section.	
721	Fiorato	553	C	T	Suggest the following locations: Line 556 to 23.5 Lines 557 to 558 - delete Lines 559 to 560 - 23.8.2 Lines 561 to 563 - 23.8.2 or delete	
722	Jirsa	553	C	T	Rename 23.10 – Inspections and Reports Lines 556 and 557-8 could be added to (h) on line 533 as part of tendon tensioning. Lines 559 to 563 could be added to (d) placement of reinforcement and anchors.	
723	Mlakar	553	C	T	What does Sub A recommend?	
724	Wyllie	553	N	T	These are all things in present code that need to be captured somewhere. The first two are submittals by Contractor to LDP. The last two are issues for the LDP to address (design issues) if they apply.	
725	Meyer	555	C	T	Place in 23.5.1	
726	Alcocer	556	C	T	I suggest as new 23.5.1(b), and renumber	
727	Becker	556	C	T	This appears to be covered in 6.3.2.1	
728	Bondy	556	N	T	Manufacturer’s test reports (mill tests) for the modulus of elasticity of prestressing steel are notoriously unreliable. They rarely appear on construction documents. If a modulus is needed independent tests are performed on actual samples of the material in question. Note that 8.5.3 permits the determination of E by tests. This does not have to be in Chapter 23.	
729	Cleland	556	C	T	This test report requirement is usually part of a much larger phase of construction that requires	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
					submittal of shop drawings. There is no section on shop drawing submittals in this chapter. Section 23.10 imposes a requirement on the licensed design professional to require inspections, but no mention that the placement of reinforcement and anchors follows the shop drawings. This indicates that a section on submittals is missing. When supplemental documents are prepared by the Contractor that interpret design documents for fabrication or erection of the structure, those documents should be submitted to the licensed design professional for verification that those documents properly represent the intent of design.	
730	Frosch	556	C	T	Don't see why this provision is needed.	
731	Kopczynski	556	C	T	First and second items could be a new Section 23.8.2, with the current 23.8.2 and following sections upped one number to 23.8.3, etc. Third item could go in 23.8.1. Fourth item is unnecessary; it's a nebulous requirement and, in any event, is more of a judgement call based on experience than an item that can be "documented."	
732	Meyer	556	C	T	Place in 23.5.1	
733	Parra	556	C	T	I suggest these items be moved to 23.8.	
734	Rabbat	556	C	T	Move to Chapter 6, Section 6.4.	
735	Seguirant	556	C	T	23.5.1(a) already requires submittal of manufacturer's mill certificate for reinforcement. There is no need to repeat it for E_p specifically, as the value on the mill report is generally useless.	
736	Alcocer	557	C	T	Include as new 23.8.2 (e), and renumber	
737	Becker	557	C	T	This appears to be covered in 2.3.8.2(d)	
738	Bondy	557	N	T	18.6.2.3 doesn't say that friction loss coefficients must appear on construction documents. It says they should be verified during stressing operations (with a reference to 18.20), i.e., that the difference between predicted and actual elongations not exceed 7%. The friction coefficients are unique to each tendon system and the supplier is not known at design time, so it is not reasonable to ask the LDP to put friction loss coefficients on construction documents, and this is virtually never done. Friction coefficients are shown on installation drawings and friction loss calculations; all done after construction documents are completed. For all of these reasons this should not be in Chapter 23.	
739	Cleland	557	C	T	Sec. 23.3.1 does not require post tension friction factors to be indicated on the design documents, so this requirement could be eliminated.	
740	Frosch	557	C	T	This provision was deleted in the 318-11 code.	

Com#	Last Name	Line #	Vote	Tag	Comments	Response
741	Seguirant	557	C	T	The LDP should require that these friction factors be shown on shop drawings, perhaps in 23.8.2.	
742	Wood	557	C	T	The terms K and μ_p are no longer used in 318-11. Suggest that Sub G determine if this provision is still required.	
743	Gustafson	558	C	T	Replace "on design drawings" with "in the construction documents".	
744	Meyer	558	C	T	Place in 23.8.2	
745	Alcocer	559	C	T	I think this item is already included in 23.5.1 (b)	
746	Becker	559	C	T	Suggest inserting as (j) in 23.8.2	
747	Bondy	559	N	T	Couplers are rarely ("never" might apply here) used in new construction. However they are used in repairs and retrofits. In that type of work it is important to show the locations of couplers and the required length of sleeves. But this is design information that the LDP must determine and show on the construction documents, not information that the contractor provides. So this should not be in Chapter 23.	
748	Cleland	559	C	T	Provision should be placed in 23.3.1 There may be a need for commentary indicating that this requirement may be met with a deferred submittal.	
749	Frosch	559	C	T	Seems that this provision would be appropriate in 23.8.2. I believe that the 318-11 wording should be maintained as the locations may not be readily known.	
750	Meyer	560	C	T	Place in 23.8.2	
751	Alcocer	561	C	T	I think this is a design issue, not a construction topic.	
752	Becker	561	C	T	Suggest inserting as (c) in 23.8.2	
753	Bondy	561	N	T	I don't think anyone does this. 7.6.7 is a section that permits bundling of post-tensioning ducts. It seems like a responsibility of the LDP to ensure that concrete can be satisfactorily placed (proper cover and clearances) and that the curvature does not result in the prestressing steel " <i>breaking through the duct</i> ". I don't believe this is a responsibility of the contractor and therefore it should not be in Chapter 23.	
754	Cleland	561	C	T	Provision should be placed in 23.3.4. There may be a need for commentary indicating that this requirement may be met with a deferred submittal.	
755	Frosch	561	C	T	Again, this could go in 23.8.2. Suggest rewording as in 318-11.	

Chapter 23 – Construction and Inspection

How to Proceed

318 LB 12-7

- 113 Editorial comments
- 574 Technical comments
- 78 “Philosophical” comments
- 765 Total comments

Philosophical Comments, Page 1

- Anderson – “It is oftentimes not clear who is the audience for this chapter.”
- Fiorato – “The overall structure and wording of sentences in this chapter lacks ‘parallelism.’”
- Ghosh – “... we are now being told that the contractor need not even read ACI 318.”

Philosophical Comments, Page 2

- Schaeffer – “Possibly this chapter could be simplified by stating that ACI 301 Specifications shall be incorporated by reference in the CDs ...”
- Becker – “I would suggest that it is not common knowledge that the contractor has no responsibility for 318 provisions.”

Philosophical Comments, Page 3

- Bondy – “I object to isolating these requirements in a separate section called ‘Construction requirements.’ Section 23.1.1 requires that *everything* in Chapter 23 must be included ...”
- 17 pages of similar comments – you get the picture!

Sub A readily admits that there are problems with this chapter.

However, we felt it was necessary to ballot the chapter to start the current conversation.

How do we go forward?

It does not make sense to work on technical comments until we have a direction that is accepted by the SC and by 318.

1. Chapter 23 is written solely to the LDP, Page 1

- This chapter does not represent a change in the Code. All construction provisions have simply been collected into a single chapter.
- This chapter does not represent a change in responsibility of the LDP.

1. Chapter 23 is written solely to the LDP, Page 2

- Stems from the General Building Code:
 - *“106.1.1 ... Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.”*

1. Chapter 23 is written solely to the LDP, Page 3

- Consistent with the recommendations of ACI 132 (Responsibility)
- LDP is responsible for including these provisions in the construction documents
- LDP is not responsible for executing the provisions

2. Construction requirements cannot be deferred to ACI 301

- ACI 301 uses ACI 318 as the basis for its requirements
- Take the requirements out of ACI 318 and they may disappear from ACI 301
- Not appropriate for the Code to require use of ACI 301 – may result in restraint of trade issues for ACI

3. Where should information appear in construction documents?

- Specifications versus drawings
- ACI 318 should not micromanage the LDP
- Practice may vary by location

4. Two distinctive types of provisions in Ch 23, Page 1

- Design information:
- Information developed by the LDP that must be provided to the contractor or the building official.
- Should not be written in spec language.
- Examples: provisions of 23.2 – Code version and information on loads or 23.4 – Member information.

4. Two distinctive types of provisions in Ch 23, Page 2

- Compliance requirements:
- Requirements that typically will go into the specifications with few or no changes.
- Should be limited to provisions that are deemed essential to result in a structure that meets the requirements of the Code.
- Examples: provisions of 23.4.3 – Placement and consolidation of concrete or 23.

4. Two distinctive types of provisions in Ch 23, Page 3

- These terms may have to be defined in Chapter 2
- May be addressed with separate, explicit section in each part of the chapter:
 - 23.4 – Concrete materials, production, and construction requirements
 - 23.4.1 – Design information. Provide the following: <list>
 - 23.4.2 – Compliance requirements. Include the following in the specifications. <list>

5. How frequently to tell the LDP to include provisions in CDs?

- Comments recommending once or multiple times, about even.
- One time in a rewritten Scope provision
- At each location where a list of requirements is provided.
 - This option may be best with the organization proposed above.

6. Revised Scope provision

- 23.1 – Scope – The provisions of this chapter shall apply to:
 - the design information and compliance requirements that the licensed design professional shall include in the construction documents for the use of the contractor, owner, or building official.
 - **Something on inspection**

Once the direction of Chapter 23 is adopted, Sub A will rewrite the chapter to conform.

Sub A will address the technical and editorial comments from this ballot to prepare the next version of this chapter.

Once the direction of Chapter 23 is adopted, Sub A will not have to resolve negatives in the philosophical category.

Sub A will review all such comments to ensure that no significant comment has been overlooked.

1 Chapter 22 New Business Items
2 318 A Toronto Meeting
3 Agenda Item 5.8.3

4 **Chapter 2 definitions**

5 **Rationale:** For consistency with the CT and ASTM.

6 ~~**Admixture** — Material other than water, aggregate, or hydraulic cement, used as an~~
7 ~~ingredient of concrete and added to concrete before or during its mixing to modify its properties.~~
8 a material other than water, aggregates, cementitious materials, and fiber reinforcement, used
9 as an ingredient of a cementitious mixture to modify its freshly mixed, setting, or hardened
10 properties and that is added to the batch before or during its mixing.

11
12 **Rationale:** Use correct term "slag cement" and replace the list with "pozzolans." Add commentary.

13 ~~**Cementitious materials** — m~~Materials have cementing value when used in concrete either by
14 themselves, such as portland cement, blended hydraulic cements, and expansive cement, or such
15 materials in combination with ~~fly ash, other raw or calcined natural pozzolans, silica fume, and/or~~ slag
16 cement, pozzolans, or both.

17
18

Commentary: A pozzolan is siliceous or siliceous and aluminous material that in itself possesses little or 19 no cementitious value but will, in finely divided form and in the presence of water, chemically react with 20 calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties. Slag 21 cement is granulated blast-furnace slag that has been ground to cement fineness. Slag cement is a 22 hydraulic cement, which means it will set under water.
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23
24
25 **Revise maximum aggregate size requirements**

26 **Rationale:** Aggregate size should also be controlled by the space between reinforcement and
27 formwork. In CA065, "minimum specified cover" was approved. This proposal uses $\frac{3}{4}$ to be
28 consistent with (c) and "smallest" is used to avoid confusion. The exception is modified to clarify
29 that the burden is on the Contractor to provide acceptable evidence that these limitations can be
30 waived.

31
32 **22.3.2.3** — Nominal maximum size of coarse aggregate shall not exceed the least of (a), (b), (b)
33 and (de):

- 34 (a) 1/5 the narrowest dimension between sides of forms;
35 (b) 1/3 the ~~depth of minimum~~ slab thickness;
36 (c) 3/4 the minimum clear spacing between individual reinforcing bars or wires, bundles
37 of bars, individual tendons, bundled tendons, or ducts.
38 (d) $\frac{3}{4}$ of the smallest specified cover.
39

40 These limitations shall not apply if, ~~in the judgment of evidence acceptable to~~ the licensed
 41 design professional ~~is provided indicating that,~~ workability and methods of consolidation are
 42 such that concrete can be placed without honeycombs or voids. <3.3.2>

43 **R22.3.2.3** — The size limitations on aggregates are provided to facilitate placement of concrete around
 44 the reinforcement without honeycombing due to blockage by closely-spaced reinforcement. <R3.3.2.>

46 **Revise the description of strength test**

47 **Rationale:** The term "strength test" should apply only to tests of standard-cured specimens.
 48 Clarify the curing method for "field-cured" specimens.

49
 50 **22.5.1.1** — A strength test shall be the average of the strengths of at least two 6 x 12 in.
 51 cylinders or at least three 4 x 8 in. cylinders made from the same sample of concrete ~~in~~
 52 ~~accordance with 22.5.3.1~~ and tested at 28 days or at test age designated for f'_c . <5.6.2.4>

53
 54 **22.5.4.1** — If required by the building official or licensed design professional, ~~results of~~
 55 ~~measured~~ strengths ~~s-tests~~ of cylinders ~~made and~~ cured in accordance with (a) and (b) shall be
 56 provided in addition to standard-cured cylinder strengths ~~s-tests~~ required by 22.5.3.: <5.6.4.1>
 57 <5.11.4>

- 58 (a) ~~At least two 6 by 12 in. or at least three 4 by 8 in.~~ Field-cured ~~test~~ cylinders shall be molded
 59 at the same time and from the same samples as standard-cured ~~test~~ cylinders <5.6.4.3>
 60 (b) Field-cured cylinders shall be cured ~~under field conditions~~ in accordance with ~~the field curing~~
 61 ~~procedure of~~ ASTM C31 ~~and tested in accordance with ASTM C39.~~

62
 63 **Revise Table 22.3.1.1**

64 **Rationale:** ASTM C595 has been revised

65
 66 **22.3.1.1** — Cementitious materials shall conform to the specifications in Table 22.3.1.1. <3.2.1>

67
 68 **Table 22.3.1.1 — Specifications for cementitious materials**

Cementitious material	Specification
Portland cement	ASTM C150
Blended hydraulic cements	ASTM C595, excluding Type IS (≥ 70) and Type IT (≥ 70) *
Expansive hydraulic cement	ASTM C845
Hydraulic cement	ASTM C1157
Fly ash and natural pozzolan	ASTM C618
Slag cement	ASTM C989

Silica fume	ASTM C1240
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Type IS (≥ 70) and Type IT (≥ 70) is not intended as principal cementing constituent of structural concrete.

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R22.3.1.1— Type IS (≥ 70) is a blended cement under ASTM C595 that contains slag as an interground component, or slag cement as a blended component, in a quantity equal to or exceeding 70 percent by mass. Type IT (≥ 70) is a blended cement consisting of portland cement and two pozzolans or portland cement, a pozzolan, and slag cement in which portland cement comprises 30 percent or less of the total mass. <R3.2.1>

Add Corrosion Inhibitor to List of Admixtures

Rationale: Corrosion-inhibiting admixtures provide another means for increasing the service life of structures exposed to chlorides. Add new Commentary to advise LDP that other admixtures for special applications can be specified to meet Type S requirements.

Add the following to Chapter 3:

ASTM C1582 / C1582M - 11 Standard Specification for Admixtures to Inhibit Chloride-Induced Corrosion of Reinforcing Steel in Concrete

22.3.4.1 — Admixtures shall conform to the following specifications: <3.6.1> <3.6.2>

- (a) For water reduction and setting time modification: ASTM C494;
- (b) For producing flowing concrete: ASTM C1017;
- (c) For air entrainment: ASTM C260;~~;~~
- (d) For inhibiting chloride-induced corrosion: ASTM C1582.

22.3.4.2 — Admixtures that do not conform to the specifications listed in 22.3.4.1 shall be subject to prior approval by the licensed design professional. <3.6.3>

R22.3.4.2 – ASTM C494 includes Type S – specific performance admixtures— that can be specified if admixtures not covered in 22.3.4.1 are desired, such as shrinkage-reducing or viscosity modifying admixtures. Type S requirements ensure that the admixture will not have adverse affects on the properties concrete.

Remove "class of concrete"

Rationale: "Class of concrete" is not defined. In the Code, each concrete mixture used on the project needs to be evaluated. Therefore, "concrete mixture" is suggested as a replacement.

R22.5.1.1 — Casting and testing more than the minimum number of specimens may be desirable in case it becomes necessary to discard an outlying individual cylinder strength in accordance with ACI 214R.^{22.4}

105 | If individual cylinder strengths are discarded in accordance with ACI 214R, a strength test is valid
 106 | provided at least two individual 6 by 12 in. cylinder strengths or at least three 4 by 8 in. cylinders are
 107 | averaged. All individual cylinder strengths that are not discarded in accordance with ACI 214R are to be
 108 | used to calculate the average strength. The size and number of specimens representing a strength test
 109 | should be the same for each ~~class-of~~ concrete mixture. <R5.6.2.4>

110 | **22.5.2.1** — Samples for preparing strength test specimens of each ~~class-of~~ concrete mixture
 111 | placed each day shall be taken in accordance with (a), (b), and (c): <5.6.2.1>
 112 |

113 | **22.5.2.2** — On a given project, if total volume of concrete is such that frequency of testing
 114 | required by 22.5.2.1 would provide less than five strength tests for a given ~~class-of~~ concrete
 115 | mixture, strength test specimens shall be made from at least five randomly selected batches or
 116 | from each batch if fewer than five batches are used. <5.6.2.2>
 117 |

118 | **22.5.2.3**— If total quantity of a given ~~class-of~~ concrete mixture is less than 50 yd³, strength tests
 119 | are not required when evidence of satisfactory strength is submitted to and approved by the
 120 | building official. <5.6.2.3>
 121 |

122 | **22.5.3.2** — Strength level of ~~an individual class-of~~ concrete mixture shall be acceptable if (a)
 123 | and (b) are satisfied: <5.6.3.3>
 124 |

125 | **Replace "qualified" with "certified"**

126 | **Rationale:** There is no clear guidance on the meaning of "qualified" in reference to technicians.
 127 | The Commentary only mentions certification. Ambiguity can be reduced by changing the term to
 128 | "certified." Proper execution of acceptance tests is critically important.

129 | **22.5.1.3 -- ~~Qualified-Certified~~** field testing technicians shall perform tests on fresh concrete at
 130 | the job site, prepare specimens for standard curing, prepare specimens for field curing, if
 131 | required, and record the temperature of the fresh concrete when preparing specimens for
 132 | strength tests. <5.6.1>
 133 |
 134 |

135 | **R22.5.1.3** — Technicians can ~~establish qualifications by becoming~~ certified through certification
 136 | programs. Field technicians in charge of sampling concrete; testing for slump, unit weight, yield, air
 137 | content, and temperature; and making and curing test specimens should be certified in accordance with
 138 | the requirements of the ACI Concrete Field Testing Technician—Grade 1 Certification Program, or the
 139 | requirements of ASTM C1077, or an equivalent program. <R5.6.1>

140 | **22.5.1.4** — ~~Qualified-Certified~~ laboratory technicians shall perform required laboratory tests.
 141 | <5.6.1>
 142 |

143
144
145
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147

R22.5.1.4— Concrete testing laboratory personnel should be certified in accordance with the requirements of the ACI Concrete Laboratory Testing Technician – Level 1 Certification Program, the ACI Concrete Strength Testing Technician Certification Program, the requirements of ASTM C1077, or an equivalent program. <R5.6.1>