MEMORANDUM

TO: Technical Committee on Building Construction

FROM: Kelly Carey, Project Administrator

DATE: October 18, 2016

SUBJECT: NFPA 5000 Second Draft TC FINAL Ballot Results (A2017)

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot with the exception of Second Revision No. 1001 as shown in the attached report.

A Second Revision that fails Ballot will be designated as a Committee Comment, marked as Reject, and published in the Comment Section of the Second Draft Report.

A Second Revision that revised text proposed in a First Revision(s) fails Ballot, a Supplementary Ballot shall be conducted to determine whether the Committee is in support of the related First Revision(s).

This Second Revision did not have an associated First Revision, thus a Supplementary Ballot is not required.

29 Members Eligible to Vote
2 Members Not Returned (Ferro, Heiza)
1 Member Voted Affirmative on All Revisions (w/ comment: Johnson)
11 Members Voted Negative on one or more Revisions (Chrisman, Davis, Frable, Hall, Hanson, Humble, Johnson, Koffel, Lovell, McElvaney, Versteeg)
1 Member Abstained on one or more Revisions: (Koffel)

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for each revision.

To pass ballot, each revision requires: (1) a simple majority of those eligible to vote and (2) an affirmative vote of $\frac{2}{3}$ of ballots returned. See Sections 3.3.4.3.(c) and 4.4.10.1 of the Regulations Governing the Development of NFPA Standards.
### SR-8004, Global Comment, See SR-8004

Eligible to Vote: 29  
Not Returned: 2  
Paul Ferro, Khaled Heiza

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<th>Vote Selection</th>
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Total Voted: 27

### SR-1004, Section No. 7.1.4.2, See SR-1004

Eligible to Vote: 29  
Not Returned: 2  
Paul Ferro, Khaled Heiza

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Total Voted: 27

### SR-1003, New Section after 8.4.3.2, See SR-1003

Eligible to Vote: 29  
Not Returned: 2  
Paul Ferro, Khaled Heiza

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Total Voted: 27
SR-1002, Section No. 7.2.5, See SR-1002

Eligible to Vote: 29
Not Returned: 2
Paul Ferro, Khaled Heiza

Vote Selection | Votes | Comments
--- | --- | ---
Affirmative | 23 | 
Affirmative with Comment | 0 | 
Negative | 3 | 

Vickie J. Lovell

Fire Safe North America promotes safety layering and a balanced fire protection design regardless of the type of construction. Fire Safe North America is voting negative on the topic of Mass Timber in tall building construction because the research is not yet complete. Two major code development organizations are studying this topic. We believe it is appropriate to carefully evaluate code change proposals based on their findings before we cast an affirmative vote to move it forward in the code process.

Aaron Johnson

revert to original, current edition.

William J. Hall

Conflict within language. SR-1001 states all interior shall be covered with 2 layer gypsum. This language conflicts

Abstain | 1 | 

William E. Koffel

In accordance with the policy of the Standards Council, I have abstained from voting on this item.

Total Voted: 27

FAILED BALLOT

SR-1001, New Section after 7.4.3.6.8, See SR-1001

Eligible to Vote: 29
Not Returned: 2
Paul Ferro, Khaled Heiza

Vote Selection | Votes | Comments
--- | --- | ---
Affirmative | 16 | 
Affirmative with Comment | 0 | 
Negative | 10 |
Vickie J. Lovell  Fire Safe North America promotes safety layering and a balanced fire protection design regardless of the type of construction. Fire Safe North America is voting negative on the topic of Mass Timber in tall building construction because the research is not yet complete. Two major code development organizations are studying this topic. We believe it is appropriate to carefully evaluate code change proposals based on their findings before we cast an affirmative vote to move it forward in the code process.

David W. Frable  I agree with negative comment submitted by Mr. Davis.

Jonathan Humble  Please see attached pdf file titled "NFPA-5000-BLC-Second-Revision-1001-2016-9-26-AISI-Negative"

Robert E. Hanson  More research should be completed and shared before the height limitation is increased in the prescriptive codes.

Richard J. Davis  At this time I feel there is insufficient substantiation for this proposal. Additional fire resistance testing, including of connections, is needed. There are unanswered questions regarding how salvageable such structures will be after a fire, and considerable concern regarding fire safety during the construction process given only a 50 ft. minimum separation distance. Such structures could still be built under a performance based design option, but I don’t think we have all the criteria in place yet to address this prescriptively.

Joseph H. Versteeg  I have been directed to submit a negative ballot. It is the position of the IFMA Board of Directors that any Code change prior to completion of the Fire Protection Research Foundation’s current study is premature.

Aaron Johnson  Proposal lacks sufficient substantiation; fire testing is incomplete.

Joe McElvaney  At this time NFPA and ICC have task groups review this new type of construction, neither group have completed their work a do additional testing is being proposed. until this work is completed and results of test(s) have been review i must vote negative on this item.
William J. Hall

This proposal is fraught with problems, which have been recognized by many interested parties, including the American Iron and Steel Institute, The International Fire Marshal’s Associations and the International Association of Fire Fighters. I offer the following points that justify a “no” vote, and outline our specific concerns with the proposal. 1) The International Fire Marshal’s Association (IFMA) opposes the proposal, taking an official position of “Oppose until further research completed.” 2) The proposed code change language is flawed and incomplete, with several major conflicts within the proposal and with other sections of the code 3) The Task Group did not exercise due diligence when crafting the measure, nor did it advance recommendations to the full Committee. 4) Existing projects should remain limited to approval by equivalency, as there is no indication that simply covering ALL surfaces with two layers of gypsum achieves the same level of performance as when a comprehensive performance-based design is employed to demonstrate equivalency. 5) The report referenced in the Committee Statement, Fire Safety Challenges of Tall Wood Buildings recommends: “Further Research Prior to Regulatory Changes.”

Mark Chrisman

Based on information provided to the committee, it does not appear that there is sufficient data to move forward with this change. Need to see the results of the current Ad-Hoc ICC committee and NFPA research foundation results before we can determine if there is support for the proposed changes.

Abstain 1

William E. Koffel

In accordance with the policy of the Standards Council, I have abstained from voting on this item.

Total Voted: 27

For Simple majority and also two-third majority election; the simple affirmative votes needed are 15 and the two-third affirmative votes needed are 18.
American Iron and Steel Institute

Negative Ballot

We are submitting a negative ballot for the following reasons:

- The proposal lacks sufficient substantiation
- A similar proposal has been defeated in another code forum
- Fire testing is incomplete
- ANSI/APA PRG 320 argument not valid

The proposal lacks sufficient substantiation:

While we appreciate the work by the task group, missing from the review are a number of relevant pieces of information that would be useful in evaluating the suitability of this proposal. We need to remember that the proposal is asking to accept the recommendation to recognize a high rise building being constructed entirely out of Heavy Timber (Type IV), and not hybrids as articulated at the meeting.

Of particular concern are the conclusions of the NFPA – Fire Safety Challenges Tall Wood Buildings [], where in Section 3.7 it states:

Section 3.7
Prioritization

“The Task 2 – Gap Analysis presents a number of issues for which greater research and understanding is necessary to better assess structural fire performance and credible fire scenarios. While all these issues are considered necessary to achieve a greater level of understanding, the following gaps are selected as having the greatest priority. These gaps are based on the need to establish a greater understanding about the potential challenges to life safety in tall timber buildings.

- Contribution of Exposed Timber to Room Fires (Section 3.3.1) – This gap is critical to not only better understand the implications of exposed timber on compartment fire dynamics, but also dispel potential myths and preconceptions regarding fire safety in timber buildings;
- Connections Between Timber Components and Timber Composite Assemblies (Section 3.2.4) – Further understanding of connection performance is necessary to demonstrate safety for a whole structural assembly in fire. This includes understanding what types of connections designers can expect, but also how these new connections perform in fire conditions; and
• Penetrations for Services (Section 3.2.7) – Understanding penetration behavior through structural elements is critical to achieving compartmentation and enabling the installation of building services for fire safety. Note that these gaps represent the author’s opinions based on previous research and discussions with a number of leading timber experts.”

These gaps suggest that there remain numerous unknowns about buildings constructed as high rise heavy timber (Type IV) buildings. Further, the focus appears to be Cross-Laminated Timber and does not include the further investigations on other Heavy Timber (Type IV) materials so listed in NFPA 5000. This represents a substantial gap in information to determine if it is suitable to for high rise construction.

In addition, this NFPA research report was only the first phase. The second phase of this research has only just begun in mid-2016 with the proposal to conduct fire endurance tests. As a result, since the research is ongoing it would be premature to accept code provisions at this time.

A similar proposal has been defeated in another code forum:
Committee Input 8006 and 8007 was based on a code change proposal G165-15 to the International Building Code-2015 (Section 510.6 “Group R-1 and R-2 Buildings of Type IIA Construction”). The claim by the wood trade association was that since Type IIA construction was permitted to achieve the 9 stories and 100 foot height so too should all Type IV constructions. This remark based on the reason statement which stated:
• “...provide[s] the structural and fire resistance capabilities necessary for taller buildings...”;
• “...entire fire and life safety “package” is at least equivalent to what is currently specified in 510.6 (Group R-1 and R-2 Buildings of Type IIA Construction)...”;
Code change proposal G165-15, and any proposed public comments that were submitted, were ultimately disapproved by the ICC governmental voting membership.

The International Code Council created an Ad-Hoc Committee on Tall Wood Buildings, and like the NFPA Research Foundation work, they are investigating the Heavy Timber products for consideration in high rise construction. At this time neither group has made any recommendations to the national model building code development process. This again suggests that this proposal is without sufficient substantiation and premature.
Fire testing is incomplete:
We disagree that all Heavy Timber Type IV constructions should be included, such as heavy timber and structural laminated timber. The discussions at the June 2016 BLC meeting only focused on Cross-Laminated Timber fire endurance testing, and did not discuss or address the other heavy timber (Type IV) manufactured materials fire test data.

Further, the US fire test reports of CLT only tested CLT panels. Not tested were: CLT columns protected by gypsum board which is a more severe test than walls, CLT floor assemblies protected by gypsum board, CLT shafts assemblies, joint protection, etc. The NFPA report [3] stated as part of its gap analysis and conclusions stated, in part, the following:

Section 3.2
Structural and Non-structural Component and Sub-system Fire Tests
“...However, there are still some areas where further research is needed in tall wood buildings to improve knowledge of timber element performance in fire.....Many of the issues are best addressed with real fire tests....”

Section 3.2.6
CLT Delamination/Char Fall-Off
“...CLT element charring and separation from the assembly can result in increased charring rate and fire intensity (Frangi, Fontana, Knoblock, & Bochicchio, Fire Behaviour of Cross-Laminated Solid Timber Panels, 2008). This has the potential to increase the fire temperature and burning rate within the compartment, and could impact the structural fire resistance at later stages in the fire duration. While this is part of the CLT burning process, this behavior will be better understood as more tests are carried out.....”

The above leaves numerous questions outstanding regarding Cross-Laminated Timber and the other material products listed under Heavy Timbers (Type IV) in NFPA 5000.

ANSI/APA PRG 320 argument not valid:
Contrary to the verbal statements made at the June 2016 BLC meeting there is no information in either the North American or foreign fire test reports/papers to indicate if any of the tested cross laminated timber (CLT) samples were manufactured to ANSI/APA PRG 320-2011[1]. When reviewing the various public fire test reports of papers there is no clear indication if any of the test sample wall panels were or were not manufactured to ANSI/APA PRG 320-2011. In addition, at the BLC meeting the wood industry attempted to distance them-selves from fire test results of CLT in Europe and Australia, however the AWC still relied on the use of CLT in Europe as the “proof of product” to market the use of CLT in the United States.

Further, when examining the AWC Technical Bulletin No. 10 [2] we find that the references used to develop the publication include foreign studies, research and code information on the subject of exposed wood members to fire. This contradicts the committee discussions at the
BLC meeting where it was stated that the only tests relevant to the US market were those where the test samples were manufactured in accordance with ANIS/APA PRG 320.

In view of the above we recommend to the BLC that this Second Revision Ballot No. 1001 receive a negative response.

Bibliography:
https://www.apawood.org/ansi-apa-prg-320


(END)