Code Amendment Proposal Form

For public amendments proposed to the 2021 editions of the International Codes

Instructions: Upload this form and all accompanying documentation. If you are submitting your proposal on a separate sheet, make sure it includes all information requested below.

All proposals must be received by **July 23, 2021.**

CONTACT INFORMATION

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Organization: Building Dept Liaison Committee of Structural Engineers Association of Colorado

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Signature: Gregory R. Kingsley

AMENDMENT PROPOSAL

Please use a separate form for each proposal.

1) Code(s) associated with this proposal. Please use acronym: IBC

If you submitted a separate coordination change to another code, please indicate which code: _____

Acronym	Code Name
DBC-AP	Denver Building Code–Administrative Provisions
DBC-*xxxx*	Denver Building Code–*xxxx (code)* amendments (e.g., DBC-IBC, DBC-IEBC)
IBC	International Building Code
IEBC	International Existing Building Code
IECC	International Energy Conservation Code

Acronym	Code Name
IFC	International Fire Code
IFGC	International Fuel Gas Code
IRC	International Residential Code
IMC	International Mechanical Code
IPC	International Plumbing Code
DGC	Denver Green Code

2) Please check here if a separate graphic file is provided: ☐
Graphics may also be embedded within your proposal below.

3) Use this template to submit your proposal or attach a separate file, but please include all items requested below in your proposal. The only formatting needed is **BOLDING**, ~~STRIKEOUT~~ AND UNDERLINING. Please do not provide additional formatting such as tabs, columns, etc., as this will be done by CPD.

Code Sections/Tables/Figures Proposed for Revision:

602.4.2.2.2
602.4.2.2.4

Proposal:

Revise as follows:

602.4.2.2.2 Protected area. Interior faces of all *mass timber* elements, including the inside face of exterior *mass timber* walls and *mass timber* roofs, shall be protected in accordance with Section 602.4.2.2.1.

Exceptions: Unprotected portions of *mass timber* ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings and walls complying with one of the following:

1.1 Unprotected portions of *mass timber* ceilings, including attached beams, shall be permitted and shall be limited to an area less than or equal to ~~20~~ 100 percent of the floor area in any *dwelling unit* or *fire area*.

1.2 Unprotected portions of *mass timber* walls, including attached columns, shall be permitted and shall be limited to an area less than or equal to 40 percent of the floor area in any *dwelling unit* or *fire area*.

1.3 Unprotected portions of both walls and ceiling of *mass timber*, including attached columns and beams, in any *dwelling unit* or *fire area* shall be permitted in accordance with Section 602.4.2.2.3.

2. *Mass timber* columns and beams that are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

Revise as follows:

602.4.2.2.4 Separation distance between unprotected mass timber elements. In each *dwelling unit* or *fire area*, unprotected portions of *mass timber* walls ~~and ceilings~~ shall be not less than 15 feet (4572 mm) from unprotected portions of other walls ~~and ceilings, measured horizontally along the ceiling and from other unprotected portions of walls~~ measured horizontally along the floor.

Supporting Information:

Purpose:
This purpose of this submittal is to incorporate the language or the G147-21 proposal [10] made to the ICC and approved during committee action hearings (CAH) in April of 2021. The G147-21 proposal recognizes the positive results of fire testing performed over the last 2 years on Type IV-B mass timber buildings that incorporated high grade adhesives already required in the code-referenced product standard for CLT (ANSI/APA PRG-320-19), but not tested previously. Importantly, this change will facilitate the use of Type IV-B construction in Denver by lowering cost and increasing aesthetic and biophilic benefits of exposed timber, and advance Denver goals for sustainable design and construction. ("Mass timber" refers to large, solid wood structural components, generally built up from smaller trees.)

Reasons:
The primary reasons why Denver should adopt this change to Type IV-B Denver Building Code are largely the same as those that prompted Denver to adopt the tall wood provisions of the 2021 code early, as part of the 2018 code adoption cycle. Those reasons were and remain:

1) To support ***Denver's stated commitment to the environment*** through its *2020 Sustainability Goals* [1], its *80x50 Climate Action Plan* [2], and its commitment to creating a healthier city to live in [3]. The proposed change will accomplish this by facilitating the use of taller mass timber construction.
2) To promote a ***symbiotic relationship between the city of Denver and regional forests***, resulting in healthier forests, less forest fire risk, healthier watersheds, and job opportunities [4, 5].
3) To ***aid the Denver Building Department*** in responding efficiently and effectively to Denver's ongoing and growing market demand for mass timber structures.
4) To ***allow Denver citizens to address the urgent need to reduce embodied carbon*** by recognizing testing in support of proposals already introduced at the national level for the International codes.

Denver's Commitment to the Environment: The City of Denver has shown continued commitment to leading the nation in environmental protection, as evidenced by Denver's *2020 Sustainability Goals* [1], the Denver *80x50 Climate Action Plan* [2], and the adoption of the *International Green Construction Codes (IGCC)*. Mass timber construction supports these and similar goals, as timber is a completely renewable, ideally local material; when harvested from sustainably-managed forests, it is easily the most sustainable structural building material available.

Mass timber structures provide additional environmental benefits, including carbon capture, reduced construction waste, and less pollution. Mass timber structures sequester carbon for the lifetime of the structure, reducing the amount of carbon dioxide released into the atmosphere, thereby reducing global climate change. As a prefabricated construction material, mass timber

creates little construction waste, and it is delivered to the site ready to be installed, resulting in less pollution from large vehicles and less traffic congestion due to construction activities.

Symbiotic Relationship Between Denver and Regional Forests: The relationship between the City of Denver and regional forests is critical to the quality of life and economic health of the city. Recent history of wildfires has made Front Range residents keenly aware of the impact of intense fires. Fire risk is reduced by judicious thinning of smaller trees from the forest which improves the resilience of remaining trees by decreasing competition for water and nutrients and improving their ability to resist and recover from fires, insects, and disease. Healthy local forests also help provide clean, safe, affordable water to Denver residents [4]. After the Hayman Fire (2002) and the Buffalo Creek Fire (1996), Denver Water spent tens of millions of dollars to mitigate impacts to the city's water supply from increased siltation and runoff [5]. Reduced wildfires mean healthy local watersheds [6].

The larger mass timber structures allowed in this proposal will create a market for forest products that in turn provides a commercial demand for precisely those small- and medium-sized trees that need to be removed from the forests to maintain their health. Commercial demand creates job opportunities in forest management and in local mass timber manufacturing facilities.

Aiding the Denver Building Department: High-rise mass timber structures have sparked the interest and imagination of local developers and designers. Without code support of this structure type, we anticipate numerous Administrative Modification Requests on an individual project basis until the time when the latest fire test results are recognized in the IBC. Acceptance of this proposal can avoid the need for many time-consuming Administrative Modification Requests associated with mass timber.

Allow Denver citizens to address the urgent need to reduce embodied carbon: Building materials and construction account for 11% of global CO_2 emissions. Adoption of this proposal is in line with recent legislation introduced in Colorado to control embodied carbon associated with construction activity and would confirm Denver's reputation as a leader in forward-thinking technologies and environmental responsibility [7].

Substantiation:
This proposal is identical in content to the G147-21 proposal [10] made to the ICC and already approved during committee action hearings (CAH) in April of 2021. Approval in the Public Comment Hearing (PCH) process in late 2021 is pending at the time of this proposal.

Fire testing upon which the G147-21 proposal is based is documented in the RISE report, "Fire Safe implementation of visible mass timber in tall buildngs – compartment fire testing" [9].

Bibliography:

[1] City and County of Denver, "2020 Sustainability Goals," 2019. [Online]. Available: https://www.denvergov.org/content/denvergov/en/office-of-sustainability/2020-sustainability-goals.html

[2] Denver Public Health & Environment, "Denver 80x50 Climate Action Plan," July 2018. [Online]. Available: https://www.denvergov.org/content/dam/denvergov/Portals/771/documents/EQ/80x50/DDPHE_80x50_ClimateActionPlan.pdf.

[3] Denver Department of Public Health & Environment, "Denver Pulbic Health & Environment," 2019. [Online]. Available: https://www.denvergov.org/content/denvergov/en/environmental-health.html.

[4] Denver Water, "Watershed Protection & Management," 2019. [Online]. Available: https://www.denverwater.org/your-water/water-supply-and-planning/watershed-protection-and-management.

[5] Denver Water, "Protecting forests and watersheds year-round," 2 April 2018. [Online]. Available: https://www.denverwater.org/education/blog/protecting-forests-and-watersheds-year-round.

[6] T. Fry, "Western Water Threadened by Wildlife," Office of Communications, U.S. Forest Service, 8 February 2016. [Online]. Available: https://www.fs.fed.us/blogs/western-water-threatened-wildfire.

[7] UN Environmental Global Status Report 2017. [Online] Available: https://www.worldgbc.org/sites/default/files/UNEP%20188_GABC_en%20%28web%29.pdf

[8] Carbon Leadership Forum, "CLF Embodied Carbon Policy Toolkit. [Online]. Available: https://carbonleadershipforum.org/clf-policy-toolkit/

[9] Daniel Brandon, Fire Safe implementation of visible mass timber in tall buildngs – compartment fire testing, RISE Report 2020:94 [Online]
Avialable: https://www.ri.se/sites/default/files/2021-02/Report%202%20Summary%20report%20FINAL.pdf
[10] G147-21, ICC 2021 Group A Proposed Changes to the I-Codes, April 11- May 5, 2021, Virtural Committee Action Hearings, p. 326 [Online]
Avialable: https://cdn-web.iccsafe.org/wp-content/uploads/IBC-General-compressed-2021-Group-A.pdf

Referenced Standards:

No new standards are referenced.

Impact:

Construction cost impact: The code change will decrease the cost of construction by reducing the required amount of noncombustible protection on ceilings in Type IV-B construction.

Design cost impact: The code change will decrease the cost of design by reducing the required calculation and documentation of areas requiring noncombustible protection on ceilings in Type IV-B construction.

Restrictiveness compared to I-codes: The proposal will be the same as the I-codes if the G-147-21 proposal is adopted in September of 2021. It will be less restrictive if the G-147-21 proposal is not adopted in the I-codes.

Note: Discuss the impact of this proposal in this section AND indicate the impact of this amendment proposal for each of the following:

- The effect of the proposal on the cost of construction: ☐ Increase ☒ Reduce ☐ No Effect
- The effect of the proposal on the cost of design: ☐ Increase ☒ Reduce ☐ No Effect
- Is the proposal more or less restrictive than the I-codes: ☐ More ☒ Less ☐ Same

Departmental Impact: (To be filled out by CPD staff)

Note: CITY STAFF ONLY. Discuss the impact of this proposal in this section AND indicate the impact of this amendment proposal for each of the following:

- The effect of the proposal on the cost of review: ☐ Increase ☐ Reduce ☐ No Effect
- The effect of the proposal on the cost of enforcement/inspection: ☐ Increase ☐ Reduce ☐ No Effect