STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

May 2018

Log No. _____

1. State Building Code to be Amended:

- ☒ International Building Code
- ☐ ICC ANSI A117.1 Accessibility Code
- ☐ International Existing Building Code
- ☐ International Residential Code
- ☐ International Fire Code
- ☐ Uniform Plumbing Code
- ☐ International Mechanical Code
- ☐ International Fuel Gas Code
- ☐ NFPA 54 National Fuel Gas Code
- ☐ NFPA 58 Liquefied Petroleum Gas Code
- ☐ Wildland Urban Interface Code

For the Washington State Energy Code, please see specialized energy code forms

Section(s): **510.2.2**
(e.g.: Section: R403.2)

Title: **Horizontal Building Separation Allowance**
(e.g: Footings for wood foundations)

2. Proponent Name (Specific local government, organization or individual):

Proponent: **Joe Mayo, AIA**
Title: **Associate Principal, Mahlum Architects**
Date: **9/18/2024; revised 12/02/2024**

3. Designated Contact Person:

Name: **Joe Mayo, AIA**
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December 4, 2024 EDITS

4. **Proposed Code Amendment**. Reproduce the section to be amended by underlining all added language, striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system of the code. If more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code, additional pages may be attached.

   Clearly state if the proposal modifies an existing amendment or if a new amendment is needed. If the proposal modifies an **existing amendment**, show the modifications to the existing amendment by underlining all added language and striking through all deleted language. If a new amendment is needed, show the modifications to the **model code** by underlining all added language and striking through all deleted language.

   Code(s) International Building Code **Section(s)** 510.2

   Enforceable code language must be used.
   ~~Amend~~ NEW section to read as follows:

510.10 Type IV podium with Group ~~R-1 and~~ R-2 occupancy above.
A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls*, limitation of number of *stories* and type of construction where the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours. Where a *horizontal assembly* contains vertical offsets, the vertical offset shall be constructed as a fire barrier in accordance with Section 707 and shall have a fire-resistance rating of not less than 3 hours.

2. The building below, including the *horizontal assembly*, is of Type ~~IVA,~~ IVB~~, or IVC~~ construction. The Type IVB construction shall have the same fire-resistance rating requirements for building elements as Type IA construction per Table 601.

3. Exposed mass timber walls are not permitted. Mass timber walls shall be encapsulated per 602.4.1.2.1.

4. The building above the *horizontal assembly* is Type ~~IIA,~~ IIIA, IV-HT, or Type VA construction.

5. All portions of the buildings above and below the *horizontal assembly* shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1

6. Interior exit stairways serving more than 6 stories above *grade plane* shall be pressurized in accordance with Section 909.6.3 and Section 909.20. Legally required standby power shall be provided in accordance with Sections 909.11 and 2702.17 for buildings constructed in compliance with this section and be connected to stairway shaft pressurization equipment, elevators and lifts used for accessible means of egress (if provided), elevator hoistway pressurization equipment (if provided) and other life safety equipment as determined by the authority having jurisdiction. For the purposes of this section, legally required standby power shall comply with 2020 NEC Section 701.12, options (C), (D), (E), (F), (H), or (J) or subsequent revised section number(s).

Commented [TB1]: reason to exclude R-1?

Commented [TB2]: It is anticipated that the podium will likely still include concrete SW or steel braced frames. CLT shearwalls would be a heavy engineering challenge to achieve the ASCE7 stiffness ratio for the two-stage analysis (12.2.3.2). It is also anticipated that the design will have to be very rational to avoid large CLT diaphragm or framing transfers with vertical or horizonal offsets. Wood connections will be limiting with overstrength considerations.

Commented [TB3]: It is desirable to continue exploring IV-B and IV-C for the podium. The proposed justification relates to adhering to area reduction (UL for 1A to reduced per 506.2 for IV-A, IV-B, IV-C). The proposal requires 602.4 'performance' requirements + additional 3hr FRR. It is known/acknowledged that a 3hr calculated pathway for CLT and GLT in FDS or other guidelines is not available. It is assumed that manufacturers would have to test to 3hrs per 703.2.1 Tested assemblies (ASTM E119 or UL 263).

Commented [TB4]: reason to exclude IIA?

Commented [JM5R4]: A reason for including IIA was to allow cold-formed steel if desired, and be wood/steel agnostic above the podium.

Commented [TB6]: 2023 in IBC 2024?

Commented [TB7]: appropriate to include standby power?

7. *Shaft, stairway, ramp* and *escalator* enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protective in accordance with Section 716.

   Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating* provided that the following conditions are met:

   1. The building above the *horizontal assembly* is not required to be of Type I construction.
   2. The enclosure connects fewer than four *stories*; and
   3. The enclosure opening protectives above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

7. *Interior exit stairways* located within the Type ~~IVA,~~ IVB~~, or IVC~~ building are permitted to be of combustible materials where enclosed by 3-hour fire-resistance-rated construction with opening protectives in accordance with Section 716.

8. The building or buildings above the *horizontal assembly* shall be permitted to have Group ~~R-1 or~~ R-2 occupancies.

9. The building below the *horizontal assembly* shall be permitted to be any occupancy allowed by this code except Group H.

10. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the *grade plane*.

11. Where the total story count is six stories or more above *grade plane*, additional fire safeguards for the Type ~~IVA,~~ IVB~~, or IVC~~ building are required during construction in accordance with *International Fire Code* Section 3312.1.

Commented [TB8]: reason to exclude R-1?

Commented [TB9]: IV-C is contemplated in IFC 3312.1. Encapsulation is only required during construction if required by IBC 602.4.

5. Briefly explain your proposed amendment, including the purpose, benefits and problems addressed. Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

Type IA requires 3-hour fire resistance rated primary structure and load bearing walls. Mass timber can also achieve 3-hour ratings with and without encapsulation and can provide a similar level of life safety. A series of full-scale fire tests, known as RISE, demonstrated that Type IVB construction can withstand much longer than 3-hours and will self-extinguish when designed per code requirements (see link below). Mass timber construction is required to utilize fire-resistant adhesives. Excluding use of mass timber walls prevents re-ignition of mass timber elements, as shown in RISE test data. Type IVA construction is not included in this proposal as it requires 3-layers of encapsulation and does not facilitate cost-effective construction. To date, there are no known Type IVA prescriptive buildings.

Allowing Type IVB construction below the 3-hour horizontal assembly provides additional options for design and construction teams. This change would open new opportunities for higher density housing, which is a priority for the region. Allowing new opportunities for mass timber construction would help develop Washington State supply chains for mass timber and provide economic development for the State. Type IA construction generally has the highest embodied carbon footprint of any construction type. Allowing Type IVB construction for podium buildings would offer an opportunity to reduce carbon emissions and help meet the States goal of reducing carbon emissions 70% by 2030.

Please see these links for additional information:
1. RISE fire testing report: https://www.ri.se/en/what-we-do/projects/fire-safe-implementation-of-mass-timber-in-tall-buildings
2. Glulam 3-hour fire testing: https://timberlab.com/uploads/resources/TE0206-DETERMINATION-OF-CHAR-RATES-FOR-GLULAM-COLUMNS-EXPOSED-TO-A-STANDARD-FIRE-FOR-THREE-HOURS.pdf
3. American Wood Council 3-hour CLT wall fire test: https://awc.org/wp-content/uploads/2022/02/NGC-CLT-Report.pdf

6. **Specify what criteria this proposal meets.** You may select more than one.
   - ☐ The amendment is needed to address a critical life/safety need.
   - ☐ The amendment clarifies the intent or application of the code.
   - ☐ The amendment is needed to address a specific state policy or statute.
   - ☐ The amendment is needed for consistency with state or federal regulations.
   - ☒ The amendment is needed to address a unique character of the state.
   - ☐ The amendment corrects errors and omissions.

7. **Is there an economic impact:** ☐ Yes ☒ No

   If no, state reason: There is no economic impact for this code change. It would drive competition between different construction methods and likely reduce costs. It would also lower the barrier to larger housing projects by relying on only one trade specialty (instead of two or more) for the building super structure.

   If yes, provide economic impact, costs and benefits as noted below in items a – f.

   a. ***Life Cycle Cost.*** Use the OFM Life Cycle Cost **Analysis tool** to estimate the life cycle cost of the proposal using one or more typical examples. Reference these **Instructions;** use these **Inputs.** Webinars on the tool can be found **Here** and **Here**). If the tool is used, submit a copy of the excel file with your proposal submission. If preferred, you may submit an alternate life cycle cost analysis.

   b. ***Construction Cost.*** Provide your best estimate of the construction cost (or cost savings) of your code change proposal.

      $Click here to enter text./square foot

      (For residential projects, also provide $Click here to enter text./ dwelling unit)

      Show calculations here, and list sources for costs/savings, or attach backup data pages

   c. ***Code Enforcement.*** List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

d. ***Small Business Impact.*** Describe economic impacts to small businesses:

e. ***Housing Affordability.*** Describe economic impacts on housing affordability:

f. ***Other.*** Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

Please send your completed proposal to: sbcc@des.wa.gov

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.