

Type IV-A, B, & C Seattle Checklist

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Introduction

The following checklist, created by the AIA Seattle Mass Timber Committee with feedback from the Seattle Department of Construction & Inspections (SDCI), is intended to provide general guidance for implementing Type IV-A, B, and C buildings per the ICC Ad Hoc Committee on Tall Wood Buildings' recommendations in the City of Seattle.

At a high level, the intent is to implement the new Type IV buildings as if all the recommended revisions to the 2021 International Building Code were currently adopted by the Seattle Building Code.

While this checklist and the following supplemental information is intended to address most common scenarios, the information presented does not address all scenarios, and exceptions may arise with your project that will trigger different requirements from the SDCI, entirely at their discretion.

Design & Pre-Submittal Checklist

Below is a summary of high-level topics that will likely be associated with your design and pre-submittal conference. Remember to schedule your conference as early as possible, preferably right after obtaining a permit number. Don't forget that high-rise buildings will trigger a specific high-rise meeting with SDCI as well.

#	Topic	Comments
1.0	2018 Code Compliance	The entire project must comply with the 2018 code and material specifications.
2.0	Fire Analysis	No fire analysis/modelling is required provided the project fully complies with all prescriptive requirements.
3.0	Special Inspections	Discuss the best approach for fire and structural special inspections during the pre-submittal conference.
4.0	Construction Fire Safety	While the SDCI does not directly review the construction fire safety plan since it is in the realm of means and methods, they will want to see that a conforming plan is in place.
5.0	Peer Review	No fire or structural peer review is required provided the project fully complies with all prescriptive requirements.

See page 2 for an expanded commentary on the above checklist.

Pre-Submittal Checklist Commentary

- 1.0 Compliance with 2018 codes for the entire project is required. A primary reason for this is the new Type IV recommendations are built off the 2018 code, not the 2015 code.

Depending on the timing of your project, it may be a challenge to comply with the 2018 Seattle Energy Code, so discuss this topic during your pre-submittal conference. As of the first version of this checklist in mid-2018, the 2018 SEC is still dependent on a model energy code being adopted. It is possible that in lieu of conforming with the 2018 Energy Code you can comply with LEED Gold or Platinum or the Priority Green Expedited permit program.

Compliance with the 2018 edition of ANSI/APA PRG 320 is required if that is the applicable material standard for the mass timber product you are using. Speak with CLT and other mass timber suppliers early in schematic design phase to confirm with which version of PRG-320 they currently comply.

It is worthwhile noting that if your project meets the prescriptive requirements of the 2015 Code (i.e. does not rely on the new tall timber Ad Hoc language), there is no need for the mass timber product being used to comply with PRG 320-2018.

*After the initial drafting of this guide with comments from the City of Seattle, the state of Washington adopted the new Type IV-A, B, and C into the current 2015 and proposed 2018 building codes. As the City of Seattle has a different code from the state this should continue to be a discussion of which code should be utilized for specific projects at a Pre-Submittal meeting.

- 2.0 Under the currently-adopted building code, fire analysis/modelling for structural fire safety is preferred for mass timber buildings above 85 ft or buildings that feature major departures from the code i.e. this is the most likely method to justify performance standards are met. With the Ad Hoc recommendations, fire analysis is only needed if the project does not comply with the new Type IV recommendations.
- 3.0 A detailed fire and structure construction inspection/observation plan is required, so consider developing a draft and bringing it to the pre-submittal conference to discuss with the SDCI. The main issue to resolve is that there are few or no Special Inspectors in the industry who are trained in mass timber building systems. The SDCI may be willing to have the Engineer of Record or a delegated sub-consultant carry out inspections, though demonstrated experience in this role would be required.
- 4.0 There are construction fire safety provisions in the new Ad Hoc recommendations that are unique requirements specifically associated with tall mass timber construction. The impacts of these requirements are currently being investigated by the AIA Seattle Mass Timber Committee and the findings of this research will be shared once some guidelines have been established.
- 5.0 Part of the basis for the approach to fire performance in the new code language is fire testing undertaken on assemblies in California. It is a prudent approach to verify how your system compares to the systems tested in California. <http://media.iccsafe.org/code-development/final-report-fpl.pdf>
- 6.0 With the Ad Hoc language, peer review is only needed if the project does not comply with the new Type IV provisions. Non-compliance does not guarantee the need for a review, this will depend on the level of non-conformity being proposed and is more likely if the proposal is determined to be beyond SDCI's level of expertise. In the case where your project may contain specific, local elements that deviate from prescriptive requirements, ensure these portions of the structure are highlighted and discussed during the pre-submittal conference to determine if an "element" peer review is warranted.

General Considerations

The following are general mass timber-related topics that may or may not be relevant to your project.

Permit Review Time

Do not plan for any special treatment for your mass timber project during permit review. As always, the main parameter dictating timeline is current workload at the City. There are, however, some things that will help your project move smoothly through the review process:

1. Keep the structural aspects within the prescriptive language of formally-adopted building code. Projects conforming to the new Type IVs shall be submitted as “architectural” variances not as structural variances, and the primary structure shall therefore conform to currently-adopted codes and material specifications. If this is not possible, a traditional Alternative Methods and Materials approach may be required.
2. The review time also depends, of course, on whether or not the project contains unusual geometry or aspects that push the boundaries on the prescriptive, code language
3. If your project conforms with Priority Green requirements an expedited review time may be possible. Refer to Topic 1.0 in the above checklist.

Diaphragms

There is precedent that some jurisdictions require CLT horizontal diaphragm elements to be sheathed with plywood in order to meet the in-plane shear structural requirements of the NDS for wood diaphragms. However, many projects have successfully implemented a CLT spline or butt-joint connections in lieu of plywood. The SDCI has indicated that depending on the specifics of your project, they are amenable to pure CLT diaphragms to be used with approved spline connections. In order for this to be accepted for your project, ensure you are using a CLT product with in-plane shear strength values from an accredited lab, are able to provide a spline connection that meets current NDS requirements, and reference applicable industry white papers to formalize your analysis and approach.

The current geometry limits imposed on wood diaphragms in the NDS 2018--specifically the 35-ft limit of cantilevered elements--still apply to mass timber diaphragms like CLT, even though there is evidence in the mass timber industry that the performance of mass timber diaphragms is not the same as plywood diaphragms. See the Permit Review Time section above for the possible consequences of not complying with prescriptive code language.

Type of Variance

The early acceptance of the new Type IV construction types by the SDCI falls under the umbrella of a code modification, and will not be formalized as a special ordinance. As a code modification, the project must be submitted as a variation from the currently-adopted building code. It is the SDCI's preference that all projects be submitted as a Type IV with variances (not, for example, a Type I-B with a combustibility variance).

New Mass Timber Products

The 2018 Code Change Drafts Chapter 2 Definition sections indicates that mass timber is defined as “nominal sawn timber, glued-laminated timber, cross laminated timber, structural composite lumber, and other timbers listed in IBC Chapter 23 (Wood) that are referenced in PRG-320.” The SDCI will require products to meet PRG 320-18 for Types IV-A, B and C.

Land Use/Design Review

The impact of the Seattle Design Review process on the regular geometry associated with optimized mass timber material use is currently being investigated by the AIA Seattle Mass Committee and the findings of this research will be shared once some guidelines have been established.

Bibliography

The following resources relate directly to the adoption of the new Type IV tall timber construction types or are relevant to general mass timber implementation in the Pacific Northwest.

Binational Softwood Lumber Council and Forestry Innovation Investment Ltd. "Nail-Laminated Timber: US Design and Construction Guide v1.0" <https://www.thinkwood.com/products-and-systems/nltguide>. Accessed August 22 2018.

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This document was produced by the AIA Seattle Mass Timber Committee. If you are interested in learning more about what the Committee does or want to get involved contact Kirsten Smith kirstens@aiaseattle.org.