Global Membership Council Webinar Series:

Mass Timber Construction

July 2022

Welcome & Housekeeping

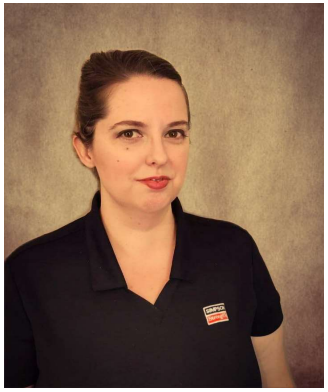
- This webinar will be recorded
- We will have time at the end for questions and discussion
- Audience members are muted with videos off by default
- If you have a question, please use the Q&A function at any time to submit the question or indicate your interest in being recognized
  - We will unmute you or ask your question during the Q&A period after each topic

The ICC Global Membership Council connects building safety professionals from outside the United States with US-based professionals who have an interest in advancing the cause of building safety internationally.

- Membership in ICC not required
- Initiatives include:
  - Webinar series
  - Global Connections Day
  - Networking opportunities

For more information visit www.iccsafe.org/membership/membership-councils/icc-global-membership-council/

Moderator



Annie Lou von Mizener
Building Technology Rep,
Simpson Strong-Tie

Speakers

Russ Vaagen
Founder & CEO
Vaagen Timbers

Boris Iskra
National Codes &
Standard Manager
Forest & Wood Products
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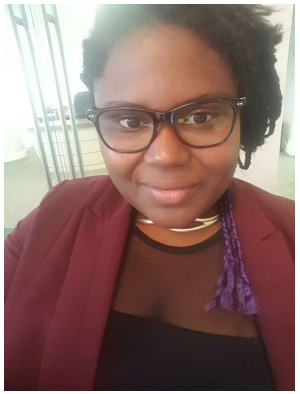
Takashi Imamura
Counsellor for Building
Regulations
Housing Bureau
Japan Ministry of Land,
Infrastructure, Transport
and Tourism

Jason Smart, PE
Director, Fire
Engineering,
American Wood Council



Ashley Delgado
Residential Energy Plan
Reviewer,
Washington, DC
Department of
Consumer and
Regulatory Affairs

Questions/Discussion

DURING THE WEBINAR: please utilize Q&A function to be recognized or ask a question to be read aloud to the panel

AFTER THE WEBINAR: We will email responses to the anyone who has entered a question into the chat box but did not receive a response during the webinar. Email new or follow-up questions to jzakreski@iccsafe.org.

Mass Timber Buildings in Australia

Boris Iskra
National Codes and Standards Manager
Forest and Wood Products Australia

FWPA - Who we are

- A not-for-profit industry services company undertaking a range of activities
- WoodSolutions initiative - World's most visited timber website
- **Independent, non-commercial, evidence-based**
- Free online resources and CPD
- R&D projects

Resourced by Forest & Wood Products Australia (FWPA) WoodSolutions is an industry initiative designed to provide information on timber and wood products to professionals and companies involved in building design and construction

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Mid-rise Mass Timber Buildings

Mid-rise timber buildings are growing in popularity as developers, builders and design professionals understand the benefits of cost-effective, reliable, efficient and the quick form of construction of mid-rise timber buildings.

Today's presentation will summarise the:

- development of building code timber construction solutions,
- BCA 2022 provisions for timber construction, and
- sustainability benefits of mass timber buildings.

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Proposal for Change – Timber Construction

The development of mid-rise timber construction building system regulatory acceptance in Australia has been spearheaded by Forest & Wood Products Australia (FWPA) who coordinated a detailed fire testing and analysis program and in Feb 2018 submitted a second Proposal for Change (PFC) which sought the modification of the Building Code of Australia Volume One, DTS provisions to extend the use of *fire-protected timber* construction systems to all classes of buildings.

PROPOSAL FOR CHANGE
NATIONAL CONSTRUCTION CODE SERIES

SUBJECT:	**Change to permit the use of *Fire-Protected Timber* structural building systems for the construction of all classes of buildings up to an effective height of 25 metres with automatic fire sprinklers.**
BCA Volume One:	**Modified Clauses: C1.13**

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Proposal for Change – Activities

- Stakeholder engagement (e.g. fire authorities, building designers, builders) to understand areas of concern and to address these during the PFC development phase
- Running of the fire risk-based model assessments for all classes of buildings
- Undertaking required fire testing of building elements to support the PFC and use of timber products
- Development of educational resources
- Delivery of stakeholder workshops/seminars

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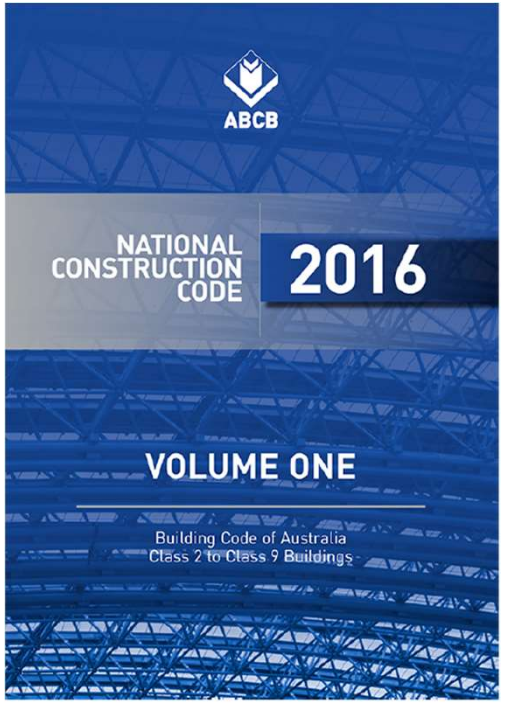
BCA 2016 – A Game Changer

The National Construction Code (NCC) provides the regulatory framework for determining the minimum design and construction requirements for buildings in Australia.

NCC 2016 Volume One
Building Code of Australia

(hereon referred to as the BCA)

for the first time, permitted mid-rise timber buildings for Class 2 (apartments), 3 (hotel/motel) and 5 (office) buildings.



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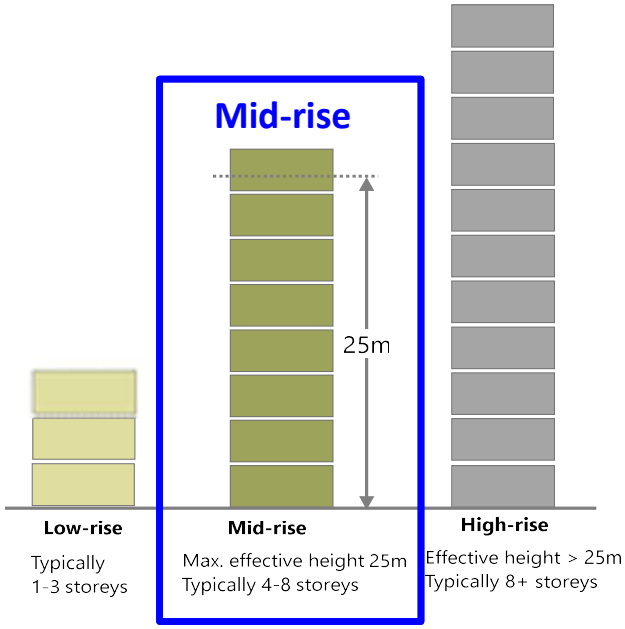
BCA 2019 – Timber Construction Provisions

The BCA 2019 was amended to permit, under the Deemed-to-Satisfy (DTS) provisions, the use of *fire-protected timber construction systems* in **all** classes of buildings up to 25 metres in effective height (approximately 8-storeys).



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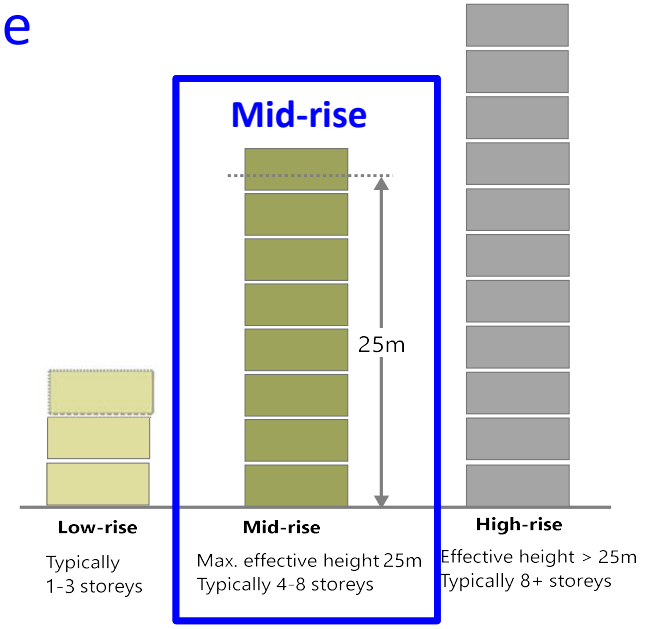
BCA 2022 – Timber DTS Provisions

Under the Deemed-to-Satisfy (DTS) provisions, the use of *fire-protected timber* construction systems can be used in the following classes of building:

- ✓ Class 2 (apartment),
- ✓ Class 3 (eg hotel/motel)
- ✓ Class 5 (office)
- ✓ Class 6 (retail)
- ✓ Class 7 (carpark, storage)
- ✓ Class 8 (laboratory, warehouse), and
- ✓ Class 9 (hospital, school, aged-care)



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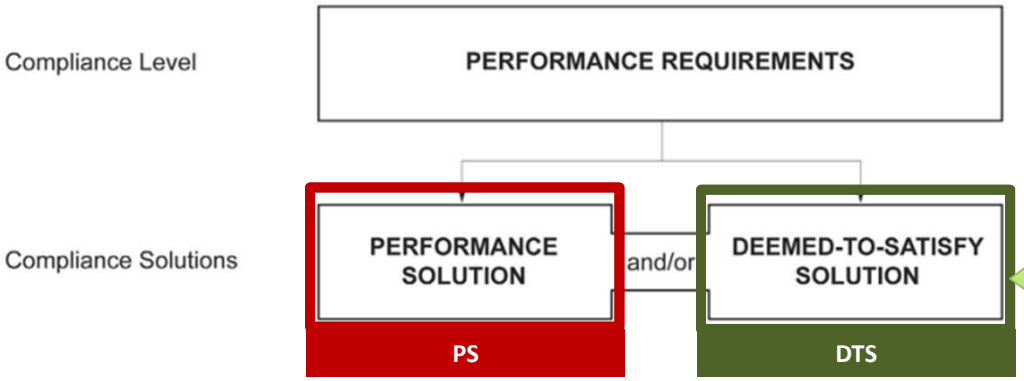
BCA 2022 Compliance Pathways

Two pathways are available under the BCA to demonstrate performance

Figure A2G1: NCC compliance structure



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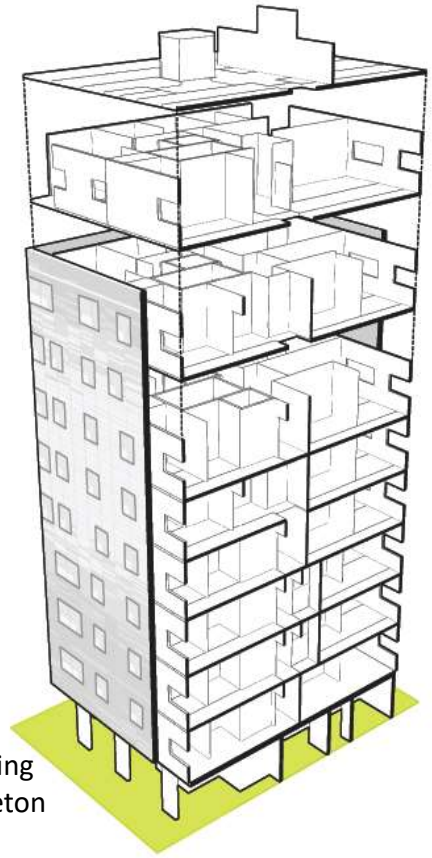
Building Form – Honeycombed structures

Class 2 – Apartments
Class 3 – e.g., Hotels/Motels
Class 9a – Hospitals and
Class 9c – Aged care facilities

All tend to be honeycombed type structures with many closely spaced walls.

There are a number of ways these can be constructed.



Project: Stadthaus Building
Architect: Waugh Thistleton
Location: London, UK

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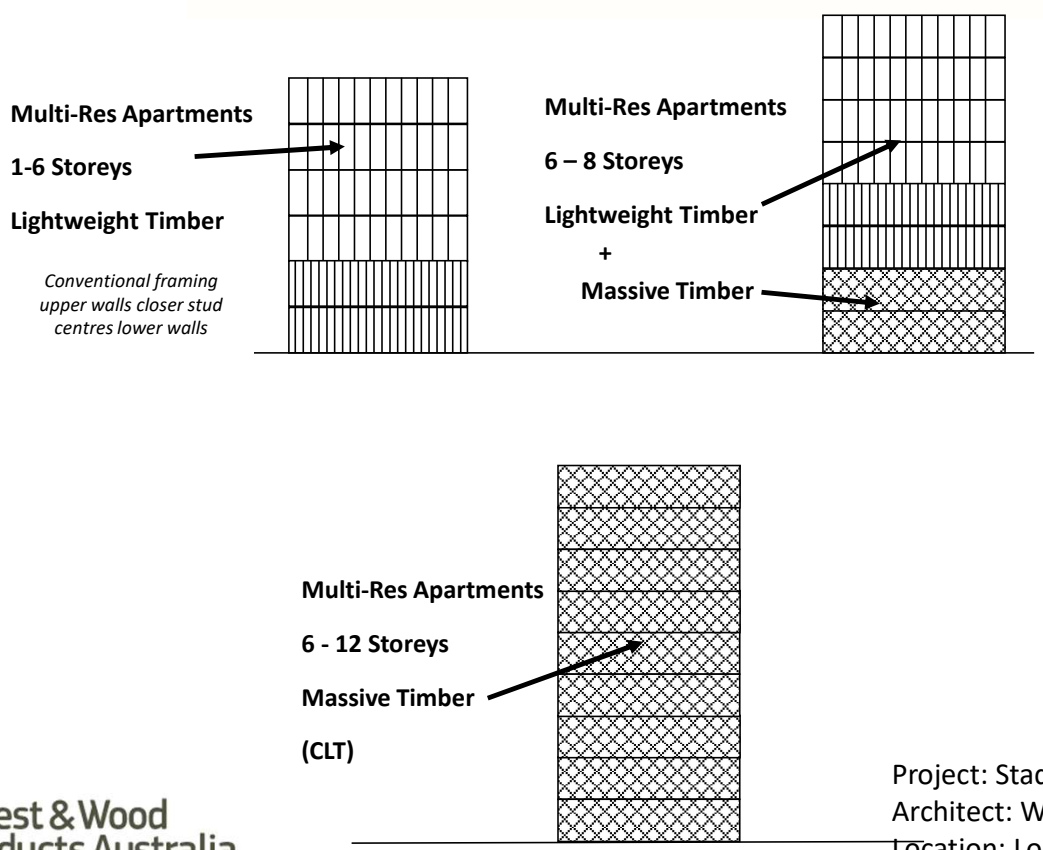
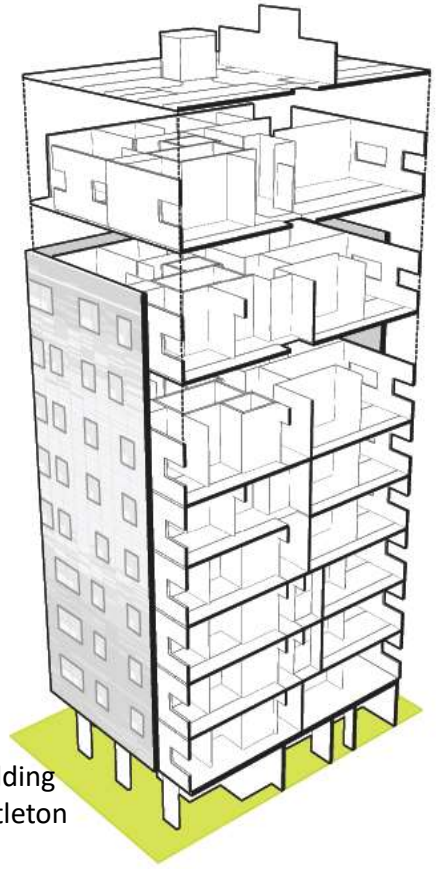
Building Form – Class 2, 3, 9a and 9c
Multi-residential, Hotel, Hospital and Aged care





Project: Stadthaus Building
Architect: Waugh Thistleton
Location: London, UK

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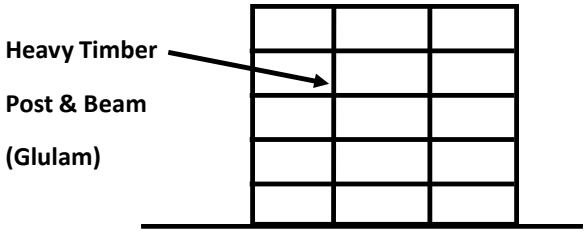
Building Form – Class 5, 6, 7, 8 and 9b Office, Retail, Carpark and Schools



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Massive Timber – NCC 2022 Definition

Schedule 1 Definitions

energy usage, when calculated in accordance with J5D14(1)(a)/13.6.2(1)(a), should be selected.

Massive timber: An element not less than 75 mm thick as measured in each direction formed from solid and laminated timber.

Maximum retained water level: The point where surface water will start to overflow out of the *shower area*.

Medium Hazard: Any condition, device or practice which, in connection with a water supply, has the potential to injure or endanger health.

Membrane: A barrier impervious to moisture.

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NCC 2022 Fire-protected Timber

C2D13 Fire-protected timber: Concession

[2019: C1.13]

Fire-protected timber may be used wherever an element is *required* to be *non-combustible*, provided—

(a) the building is—

(i) a separate building; or

(ii) a part of a building—

(A) which only occupies part of a *storey*, and is separated from the remaining part by a *fire wall*; or

(B) which is located above or below a part not containing *fire-protected timber* and the floor between the adjoining parts is provided with an FRL not less than that prescribed for a *fire wall* for the lower *storey*; and

(b) the building has an *effective height* of not more than 25 m; and

(c) the building has a sprinkler system (other than a FPAA101D or FPAA101H system) throughout complying with Specification 17; and

(d) any insulation installed in the cavity of the timber building element to have an FRL is *non-combustible*; and

(e) cavity barriers are provided in accordance with Specification 9.

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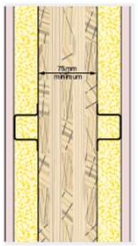
General Fire Design Principles

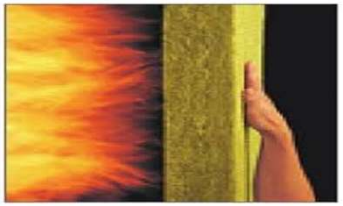
Firstly, the use of **automatic fire sprinklers**
to suppress a fire before the timber structure is threatened

Secondly, the use of **fire-grade plasterboard** to effectively 'fire-protect' the timber elements
in the low probability event that the sprinklers fail

Thirdly, the use of **cavity barriers** to prevent fire or smoke spread through the cavities
if the fire-grade plasterboard is breached



Fourthly, the use of **non-combustible insulation** to minimise fire spread in cavities
if the fire-grade plasterboard is breached



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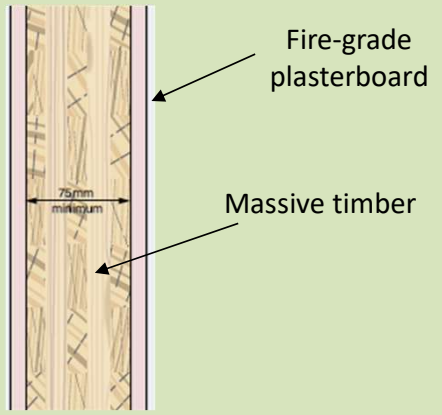
Fire-Protected Timber – Massive Timber

Massive Timber *(Lower level of protection to timber)*

- Minimum 75mm thickness of massive timber element, with required FRL, with no concealed spaces between plasterboard coverings and timber
  e.g. CLT, Glulam, LVL

- Fire protective covering required:
  - Element with appropriate layers of fire protective covering, generally (min.) 1 layer of **16mm** fire-grade plasterboard for walls and ceilings



WS Design Guides: DTS Requirements

Rise in storeys or effective height	Multi-residential		Office	Retail	Car Park/ Storage	Factory/ Laboratory	Hospitals/ Public assembly/ Schools
	Class 2	Class 3	Class 5	Class 6	Class 7	Class 8	Class 9
Effective height greater than 25m	High	High	High	High	High	High	High
8[EH]	Mid	Mid	Mid	Mid	Mid	Mid	Mid
7	Mid	Mid	Mid	Mid	Mid	Mid	Mid
6	Mid	Mid	Mid	Mid	Mid	Mid	Mid
5	Mid	Mid	Mid	Mid	Mid	Mid	Mid
4	Mid[1]	Mid[1]	Mid	Mid	Mid	Mid	Mid
3	Low[1]	Low[1]	Mid	Mid	Mid	Mid	Mid
2	Low[1]	Low[1]	Low	Low	Low	Low	Mid
1	Low	Low	Low	Low	Low	Low	Low

Mid-rise Timber Buildings
Multi-Residential
Class 2 and 3

Mid-rise Timber Buildings
Commercial and Education
Class 5, 6, 7, 8 and 9b (including Class 4 parts)

Mid-rise Timber Buildings
Healthcare
Class 9a and 9c

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Efficiencies and Cost Benefits

DIFFERENTIAL VALUE

IMPROVED SAFETY

FASTER DELIVERY

LOWER PRELIMINARIES

REDUCED FOUNDATIONS

LOWER IMPACTS

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RLB Rider Levett Bucknall

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The Ultimate Renewable®

Australian softwood plantations (>1Mha) grow

Once turned into **Engineered Wood Products,** this equates to

19-23 m3/min SAWLOGS

11-14 m3/min EWPs

4,300 m3

5-6.5 hrs

Atelier, Melbourne

2,700 m3

3-4 hrs

Strongbuild, Sydney

1,700 m3

2-2.5 hrs

Multiplex, Frankston

970 m3

1-1.5 hrs

Lendlease, Melbourne

EWPs HAVE A «BUILT-IN» CARBON OFFSET

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What's Old is New Again!

Perry House

Brisbane
1913 & 2018

25 King

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Mass Timber Buildings in Australia

Thank-you

Boris Iskra
National Codes and Standards Manager
Forest and Wood Products Australia

ICC Global Membership Council Webinar Series:
Mass Timber Construction

July 25, 2022
(July 26, 2022 in Tokyo)

Japan's Challenges to Promote Carbon Neutrality & Tall Mass Timber Construction

Takashi IMAMURA

Counsellor for Building Regulations, Housing Bureau
Ministry of Land, Infrastructure, Transport and Tourism (MLIT), JAPAN

GHG Emission Reduction Goals of Each Country

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Country /Region	NDC (2030 goal)	Date of NDC submitted	Net zero by 2050
Japan	-46% (from 2013 level) Japan will continue efforts to meet the lofty goal of cutting its emission by 50%.	NDC submitted on 22 October 2021	Declared
U.S.	-50 to -52% (from 2005 level)	NDC submitted on 22 April 2021	Declared
Australia	-43% (from 2005 level)	NDC submitted on 16 June 2022	Declared
Canada	-40 to -45% (from 2005 level)	NDC submitted on 12 July 2021	Declared
U.K.	-68% or more (from 1990 level)	NDC submitted on 12 December 2020	Declared
France, Germany, Italy, EU	-55% or more (from 1990 level)	NDC submitted on 18 December 2020	Declared
China	(1) To reach peak CO_2 emissions before 2030 (2) To reduce CO_2 emissions per GDP by 65% or more (from 2005 level)	NDC submitted on 28 October 2021	Net zero CO_2 emissions by 2060

Source: Compiled based on the website of UNFCCC and the Ministry of Foreign Affairs of Japan

Regulatory Measures under the Building Energy Efficiency Act of Japan

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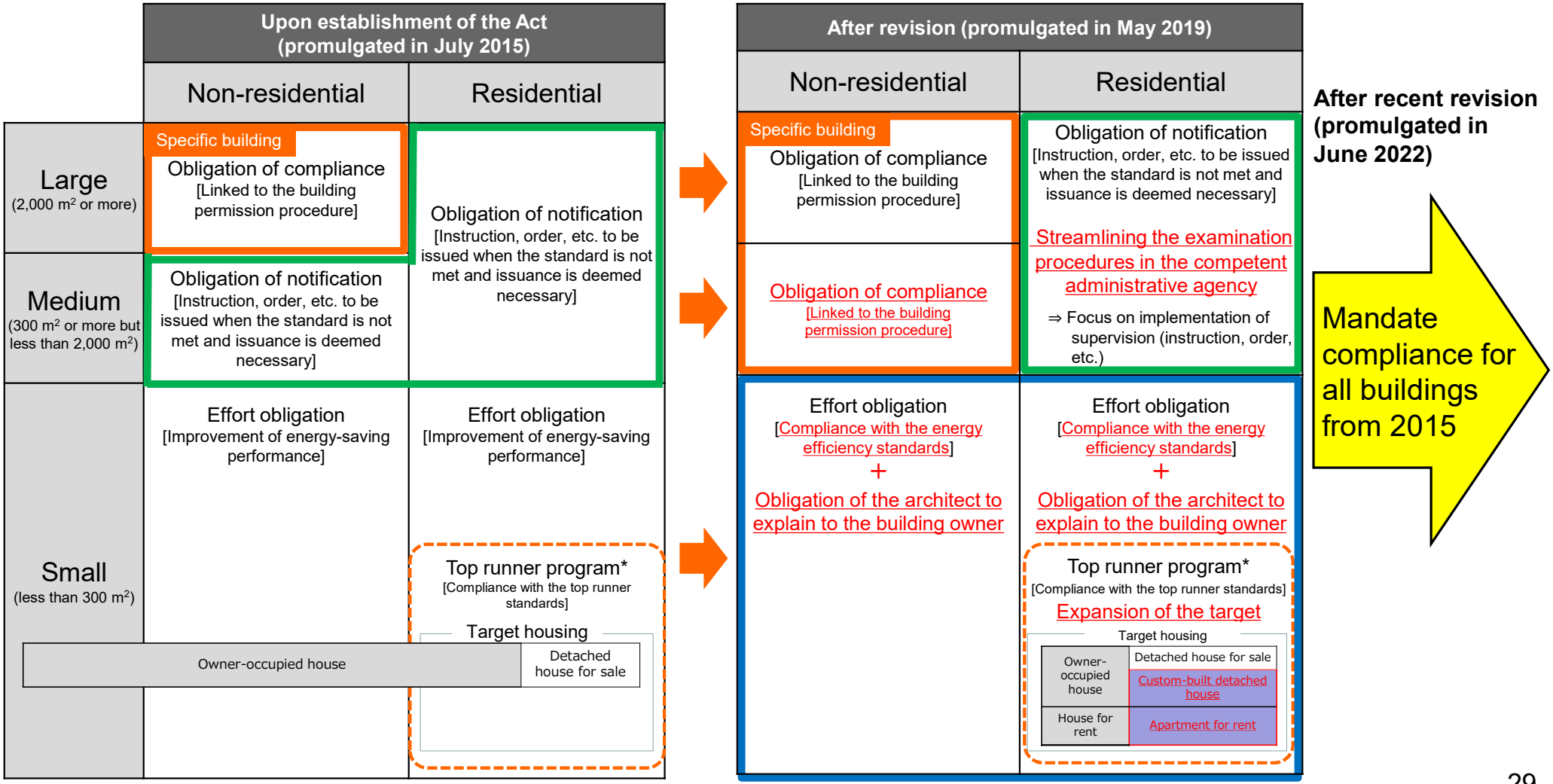

* If it is deemed necessary to improve the energy-saving performance of a major housing developer to a considerable extent, such as insufficient compliance with the top runner standards, the developer will be subject to the recommendation, order, etc. by the Minister of MLIT.

Relationship between Energy Consumption and the Number of Building Starts (by Use, by Size)

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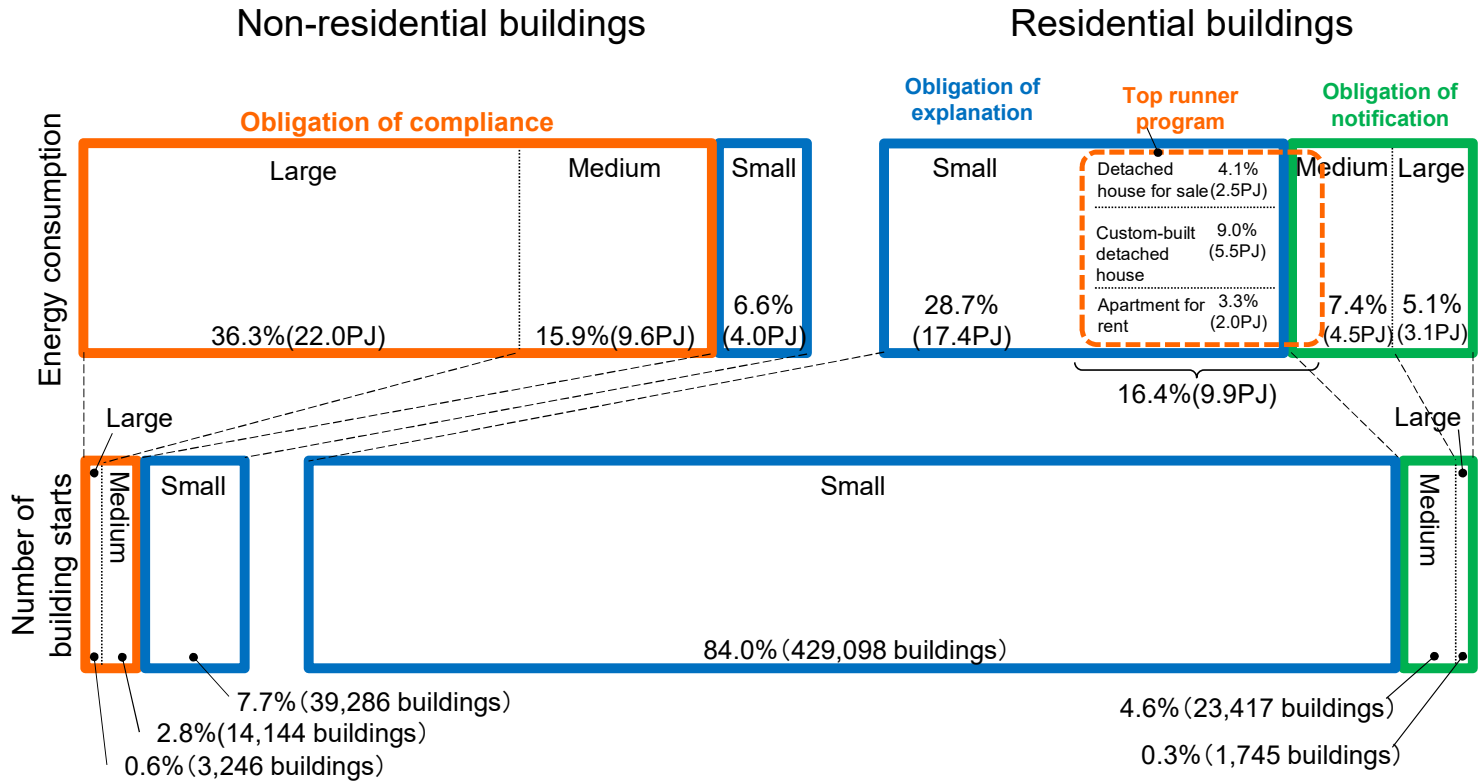
- **The number of buildings subject to the obligation of compliance accounts for 3.4% of the total number of building starts (0.6% for large buildings and 2.8% for medium buildings), but their energy consumption accounts for 52.2% of the total energy consumption (36.3% for large buildings and 15.9% for medium buildings).**



* Estimated by assuming that the average energy intensity of buildings is 878 MJ/m^2/year, and average energy intensity of houses is 344MJ/m^2/year, based on the 2017 Energy and Economy Statistical Abstract and the 2017 Statistics on Building Starts.

Thermal Insulation Performance of Housing Stock

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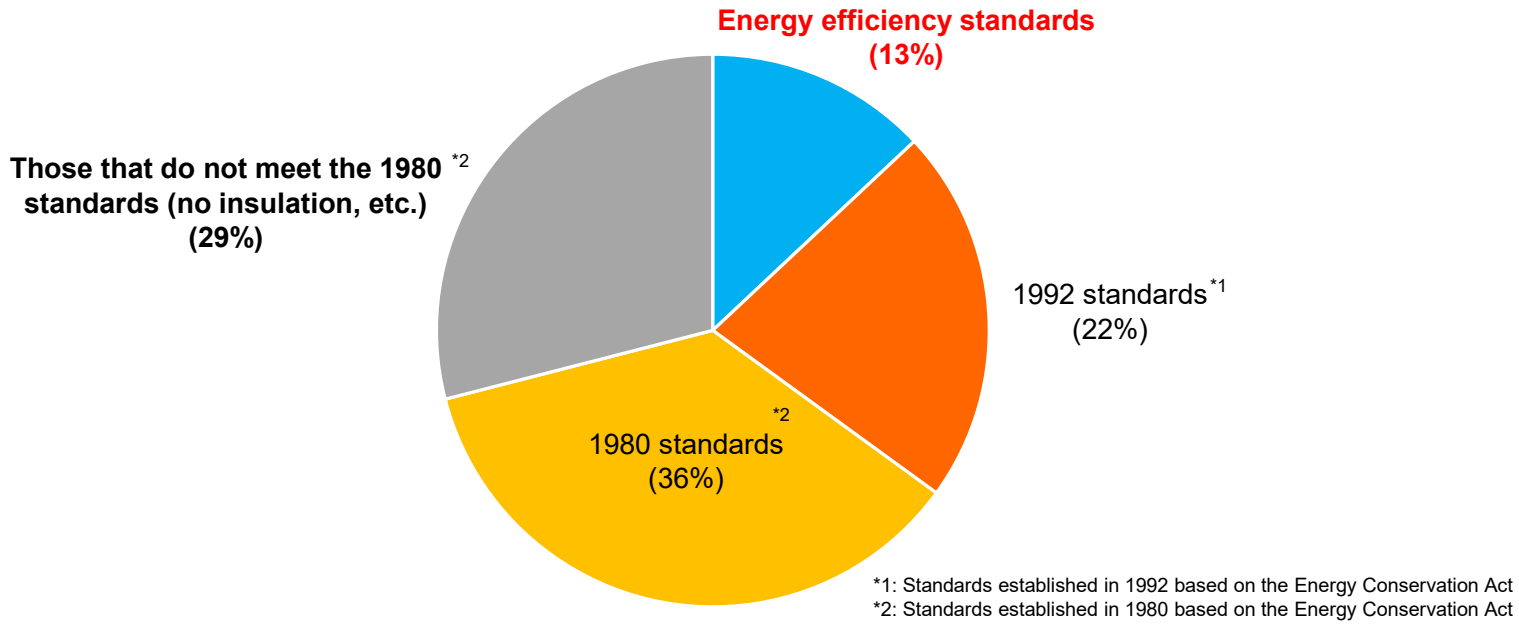
- **As of FY2019, about 13% of the total housing stock (about 50 million units) complies with the energy efficiency standards, and about 29% of the total housing stock is uninsulated.**
- **According to the Housing and Land Survey (2018), the actual number of thermal insulation renovations for the housing stock in less than five years from January 2014 to October 2018 was about 720,000 units.**

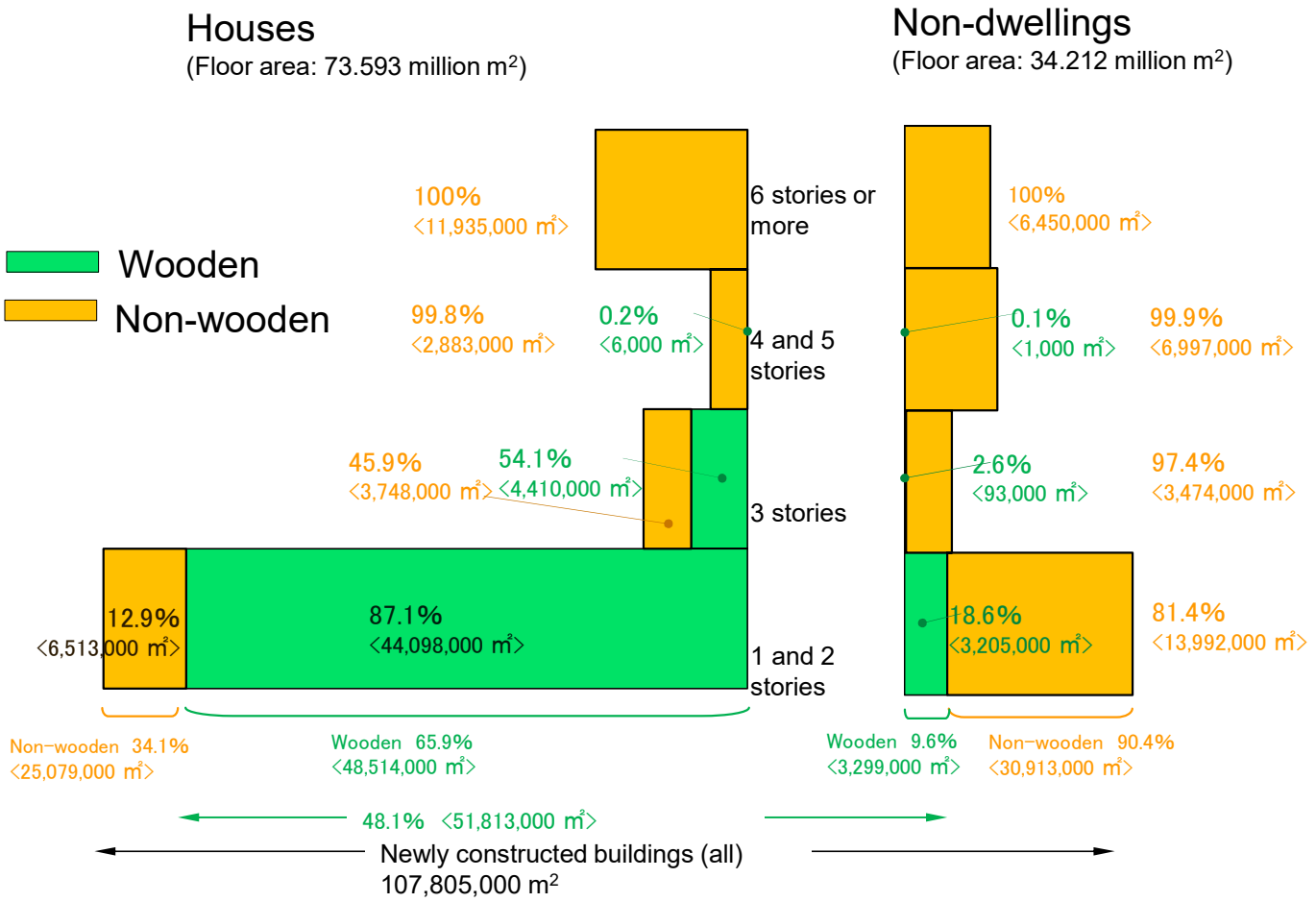
Thermal insulation performance of housing stock (about 50 million units)



*1: Standards established in 1992 based on the Energy Conservation Act
*2: Standards established in 1980 based on the Energy Conservation Act

Source: Calculated based on the distribution of housing stock by performance according to the MLIT survey, reflecting the number of renovations according to the Housing and Land Survey and the estimated number of newly constructed housing units by performance based on business operator's questionnaire, etc. (FY2019).

Use of Wood in Buildings in Japan



Source: Statistics on Building Construction Start in FY2019.

Comparison of required cross sections of columns supporting vertical loads (example)

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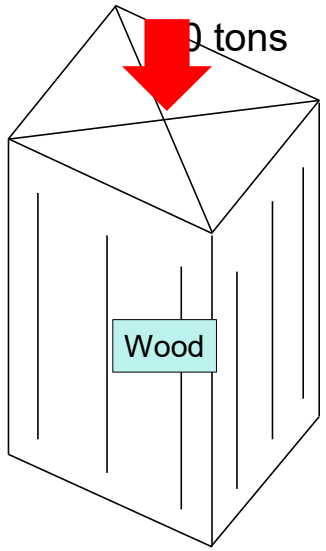
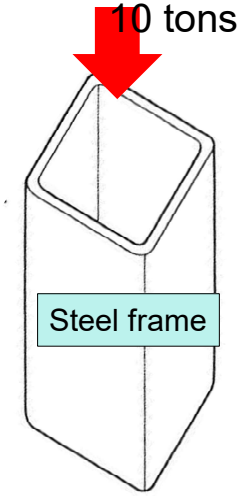
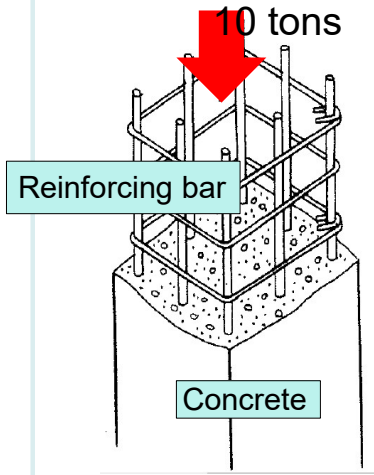
	Wooden	Steel	Reinforced concrete
			
Required cross section (mm)	Width x Depth 92×92	Width x Depth x Thickness 50×50×2.3	Width x Depth 80×80
Short-term allowable compressive stress (N/mm^2)	11.8	235	16

Comparison of earthquake loads acting on buildings (example)

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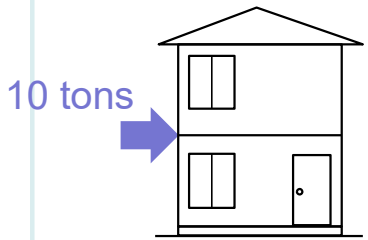
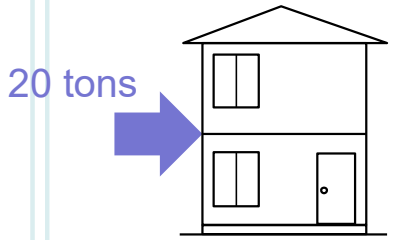
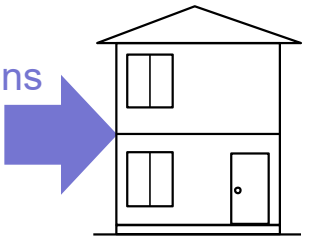
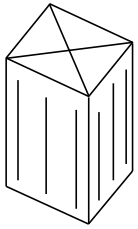
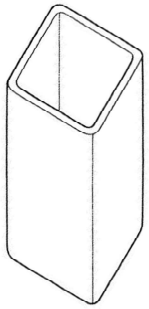
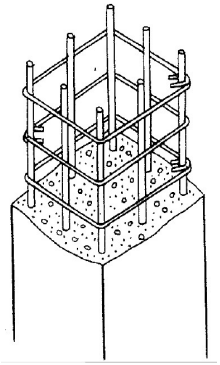
	Wooden	Steel	Reinforced concrete
Ratios of earthquake loads acting on buildings	 1	 2	 4
Ratios of weights of buildings	1	2	4
Required cross section	Width x Depth 92×92 	Width x Depth x Thickness 100×100×2.3 	Width x Depth 160×160 

Changes in the fire protection standards of the Building Standard Law of Japan #1 (Past tightening of regulations)

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<Amendments following disasters, etc.>

Large-scale fires frequently occurred.

1956: Kanda Kyoritsu Kodo Fire (Chiyoda-ku, Tokyo)
1957: Meijiza Fire (Chuo-ku, Tokyo)
1958: Tokyo Takarazuka Theater Fire (Chiyoda-ku, Tokyo) (3 fatalities)

→ **1959: Building Standard Law amended**

- ✓ Setting of interior restrictions
- ✓ Setting of simple fire-resistive buildings

Fires in bars, cabarets, etc. increased.

→ **1961: Cabinet Order amended**

- ✓ Tightening of interior restrictions

Fires in fire-resistive buildings frequently occurred (oxygen shortage and gas poisoning occurred in many cases).

1966: Kanai Building Fire in Kawasaki City (Kawasaki City, Kanagawa Prefecture) (12 fatalities)
1968: Yuraku Sauna Fire (Chiyoda-ku, Tokyo) (3 fatalities)
International Theater Fire (Taito-ku, Tokyo) (3 fatalities)

→ **1969: Cabinet Order amended**

- ✓ Measures for through areas of compartments
- ✓ Setting of pit compartments
- ✓ Tightening of interior restrictions

Kanai Building Fire (1966)

Fires in Japanese inns and hotels frequently occurred.

1966: Kikufuji Hotel Fire (Minakami Onsen, Gunma Prefecture) (30 fatalities)
1968: Ikenobo Mangetsujo Fire (Kobe City, Hyogo Prefecture) (30 fatalities)
1969: Banko Hotel Fire (Banko Atami Onsen, Fukushima Prefecture) (30

→ **1970: Building Standard Law amended**

- ✓ Installation of emergency lifts, smoke exhaust equipment, emergency lighting systems, and emergency approaches

Worst building fire in Japan

1972: Sennichi Department Store Fire (Osaka City, Osaka) (118 fatalities)

→ **1973: Cabinet Order amended**

- ✓ Stipulation of normally closed type fire doors
- ✓ Establishment of a standard for fire dampers
- ✓ Expanded application of two or more direct stairways
- ✓ Tightening of interior restrictions

Fires frequently occurred during extension and other construction works.

1973: Seibu Takatsuki Shopping Center Fire (Takatsuki City, Osaka) (6 fatalities)
Taiyo Department Store Fire (Kumamoto City, Kumamoto Prefecture) (100 fatalities)

→ **1976: Building Standard Law amended**

- ✓ Restrictions on use before the issuance of inspection completed certificates

Sen-nichi Department Store Building Fire (1972)

Rationalization of fire-resistive building regulations following the 1998 amendment of the Building Standard Law of Japan

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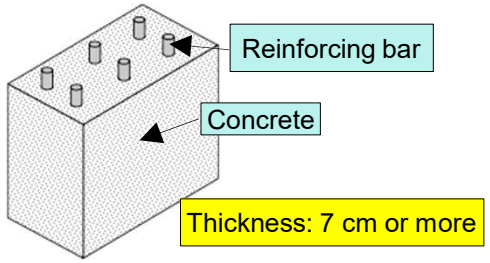
Before 1998

✓ Fire-resistive structures were limited to reinforced concrete structures, brick structures, and other structures consisting of noncombustible materials.

Example of fire-resistive structure



✓ A uniform fire endurance time* was required in accordance with the number of stories of the building.

*Within 4 floors from the top floor: 1 hour
5 or more floors and within 14 floors from the top floor: 2 hours
15 or more floors from the top floor: 3 hours

After the amendment in 1998

✓ Ligneous fire-resistive structures using wood are also permitted on condition that they have the required performance.

1-hour fire-resistive | 2-hour fire-resistive | 3-hour fire-resistive

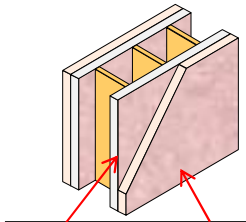


Image of notified specifications of wall

Wooden column provided with fire-resistive covering

✓ Rationalization of uniform fire endurance times in accordance with the number of stories
⇒ A verification method for calculating required fire endurance times in accordance with the fire properties anticipated from the scale and application of each building was introduced.

Increase of ligneous fire-resistive buildings (not necessarily comprehensive)

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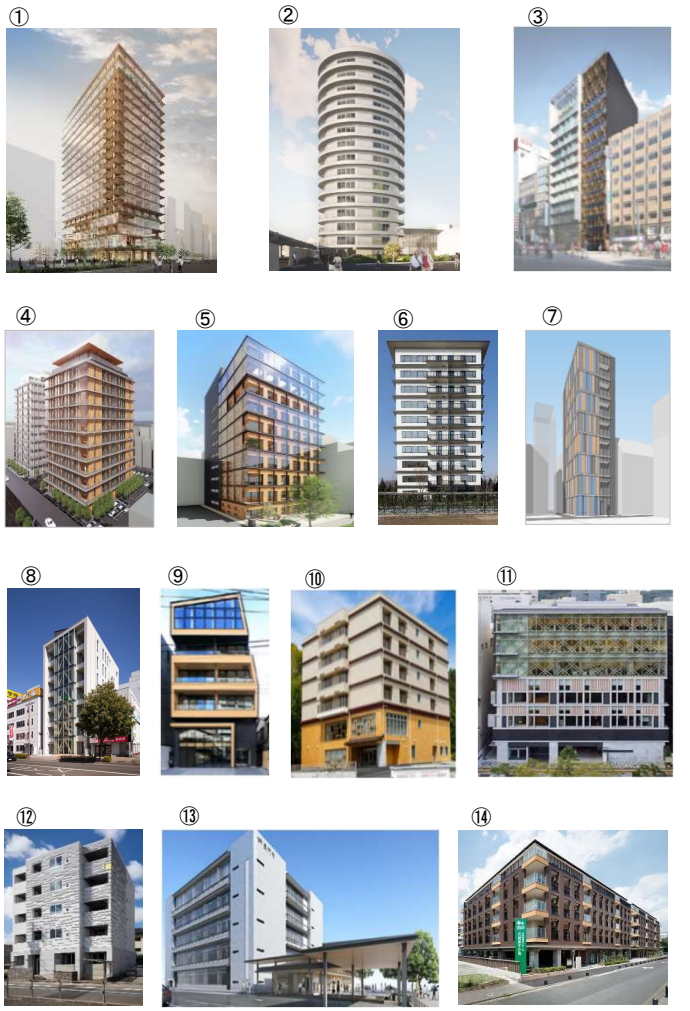
	Name of building	Occupancy	Number of stories	Structure	Mixed structure	Total floor area	Location	Completion
①	Nihonbashi Mokuzo Building	Office, Commercial, etc.	17	Hybrid wooden structure	Yes	26,000㎡	Chuo-ku, Tokyo	2025 (Planned)
②	Toyo Kinomachi Project	Apartment house, office, commercial	15	Wooden structure (CLT Panel) (2nd to 15th floors) RC structure (1st floor)	Yes	2,876㎡	Kamagaya Chiba	2022 (Planned)
③	Ginza 8-chome Development Project	Commercial building	12	Wooden structure, steel structure (hybrid structure)	Yes	2,451㎡	Chuo-ku, Tokyo	2021
④	Flats Woods Kiba	Apartment house	12	Wooden structure, RC structure	Yes	9,258㎡	Koto-ku, Tokyo	2020
⑤	(Tentative name) OY project	Training center	11	Wooden structure (frame construction method) *CLT is used for the 2nd to 9th floors, bearing walls, and the roof.		3,497㎡	Yokohama, Kanagawa Prefecture	2021 (Planned)
⑥	PARK WOOD Takamori	Apartment house	10	Steel structure + wooden structure (CLT)	Yes	3,331㎡	Sendai, Miyagi Prefecture	2019
⑦	PARK WOOD office iwamotocho	Office	8	Wooden structure, steel structure (CLT-RC composite slab)	Yes	641㎡	Chiyoda-ku, Tokyo	2020
⑧	Takaso Mokkou Building	Office, commercial, apartment house	7	Wooden structure (frame construction method)		1,029㎡	Sendai, Miyagi Prefecture	2021
⑨	THE WOOD	Office, Apartment house	6	Wooden structure (frame construction method) (3rd to 6th floors) Steel structure (1st and 2nd floors)	Yes	705㎡	Ota-ku, Tokyo	2018
⑩	Haruno Garden	Welfare facility for the elderly	6	Wooden structure (CLT panel construction method and frame construction method) (3rd to 6th floors) RC structure (1st and 2nd floors)	Yes	989㎡	Kochi, Kochi Prefecture	2018
⑪	Kochi Prefectural Residents Association Hall	Office	6	Wooden structure (frame construction method) (4th to 6th floors) Steel structure (1st to 3rd floors) *CLT is used for bearing walls.	Yes	3,649㎡	Kochi, Kochi Prefecture	2016
⑫	yeni ev Minamisasaguchi	Apartment house	5	Wooden structure (frame construction method)		743㎡	Niigata, Niigata Prefecture	2018
⑬	Nagato City Hall	Government office building	5	Ligneous hybrid structure (wood + RC composite beams)	Yes	7,127㎡	Nagato, Yamaguchi Prefecture	2019
⑭	Hanabatake Asukaen	Special elderly nursing home, etc.	5	Wooden structure (2x4 construction method) (2nd to 5th floors) RC structure (1st floor)	Yes	9,773㎡	Adachi-ku Tokyo	2016



Changes in the fire protection standards of the Building Standard Law of Japan #2 (Recent deregulation)

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	Scale of wooden structure that can be constructed (Outside of fire prevention and quasi-fire prevention districts)	○: Can be constructed. △: Can be partly constructed. ×: Cannot be constructed.			
		Wooden building surrounded by boards, etc. (fire-resistive construction, etc.)  Example: Wood + Plasterboard		Wooden building with exposed wood on the surface (quasi fire-resistive construction, etc.)  Example: Lumbering, glued laminated wood	
		Three stories or more	Over 3,000 m²	Three stories or more	Over 3,000 m²
Before 1992	Limited to 3,000 m² or less, and two stories or less, for apartment houses, schools, inns and hotels, etc.	×	×	×	×
From 1993	Three-story apartment houses are permitted.	△ (Only three-story apartment houses)	×	×	×
From 2000	Three stories or more, and 3,000 m² or more, regardless of the occupancy. (Introduction of the performance-based code)	○ (Three stories or more, all occupancies)	○	×	×
From 2015	Exposed wood on the surface of three stories or more, and 3,000 m² or more.	↓	↓	△ (Up to three stories)	△ (Up to three stories, requiring compartments)
From 2019	Exposed wood on the surface of four stories or more	↓	↓	○ (Four stories or more)	↓
From 2024	Exposed wood on the surface of 3,000 m² or more	↓	↓	↓	○

Immediate challenges in promoting the use of wood in buildings

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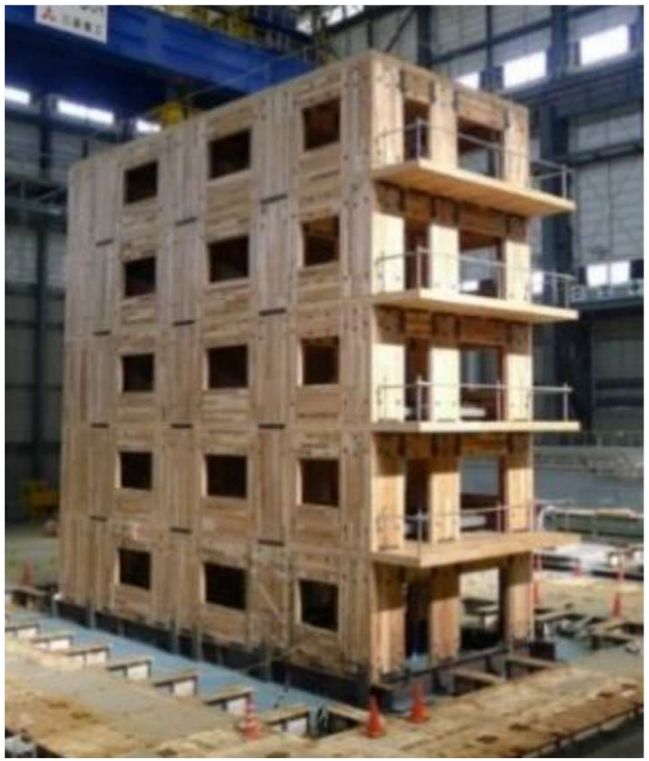
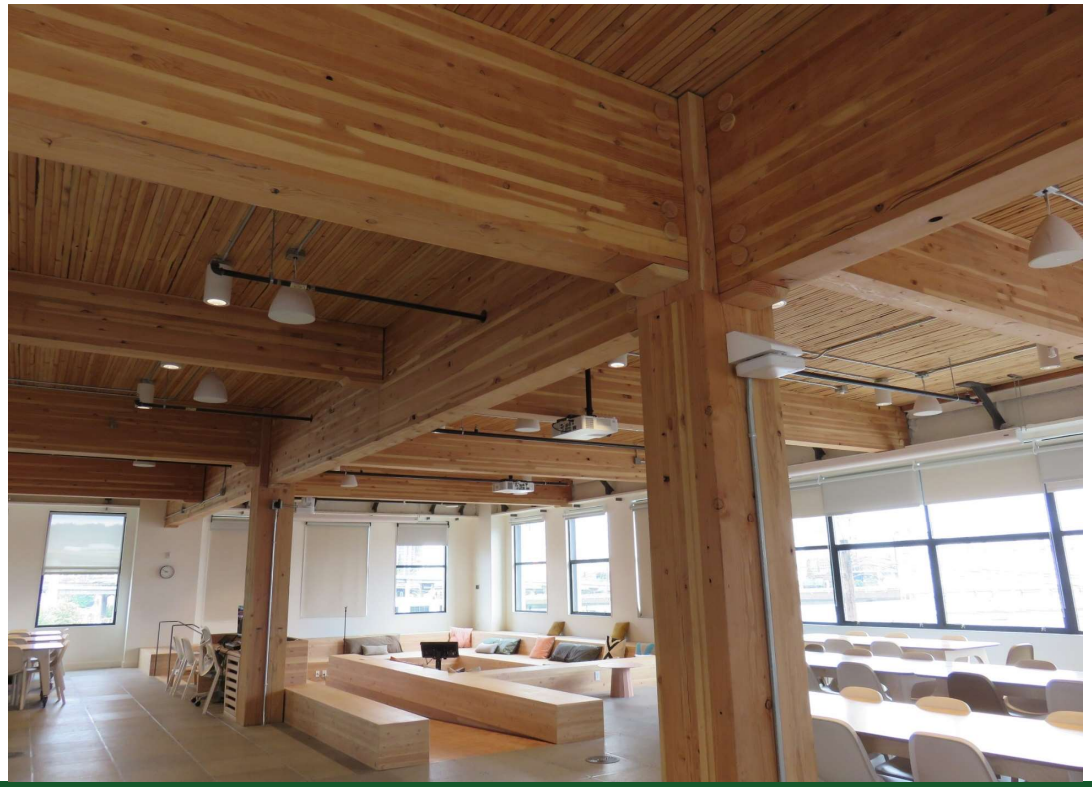
- Further rationalizing the building code
  - ✓ Especially, fire protection regulations
- Promoting people's better understanding (Dispatching information)
  - ✓ Highlight contribution to carbon neutrality
  - ✓ Clear up the negative image of wood (weak, combustible, etc.)
- Reducing construction cost (Technological development & business efforts)
  - ✓ Wooden is 10-15% more expensive than non-wooden?



Nagato City Hall



Mass Timber Structures: Codes And Adoptions

Jason Smart, P.E.
Director, Fire Engineering
American Wood Council

AMERICAN WOOD COUNCIL

TWB Ad Hoc Objectives

TWB-identified performance objectives to be met:

1. No collapse under reasonable scenarios of complete burn-out of fuel without automatic sprinkler protection being considered

2. No unusually high radiation exposure from the subject building to adjoining properties to present a risk of ignition under reasonably severe fire scenarios

3. No unusual response from typical radiation exposure from adjacent properties to present a risk of ignition of the subject building under reasonably severe fire scenarios

TWB Ad Hoc Objectives (Continued)

TWB identified performance objectives to be met:

4. No unusual fire department access issues

5. Egress systems designed to protect building occupants during design escape time, plus a factor of safety

6. Highly reliable fire suppression systems to reduce risk of failure during reasonably expected fire scenarios. Degree of reliability proportional to evacuation time (height) and risk of collapse.

TWB Committee

TWB Fire Work Group helped develop fire test scenarios to study and validate the TWB code change proposals

- Test structure represented multi-story condo
- 30’ x 30’ interior dimensions
- Corridor and stair included in the structure
- UL “modern furnishings” fuel load imposed → 570 MJ/m^2
  - fuel load was approximately 85th percentile of Group R fuel loads from survey of Group R’s

TWB Committee Proposals

TYPE OF CONSTRUCTION

TYPE IV-A Mass Timber with noncombustible protection

- Noncombustible protection shall provide 2/3 of the required Fire Resistance Rating for Building Elements (Table 601, 602)
- Taller buildings therefore not permitted to have exposed mass timber

TYPE IV-B Mass Timber with limited portions of noncombustible protection omitted

- limits on how much mass timber can be exposed
- limits on how close exposed areas can be to one another

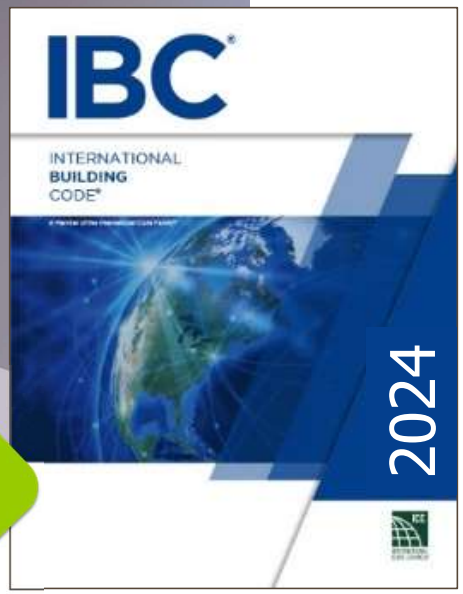
TYPE IV-C Mass Timber with no requirement for noncombustible protection, except certain features

IBC Section 602.4 Requirements

- Mass Timber elements shall have a fire resistance rating analogous to Type I Construction, with 2/3 coming from noncombustible protection.
- Mass Timber CLT elements shall be tested and labeled for Heat Performing Adhesives
- All building elements including load-bearing and nonload-bearing walls and partitions must be mass timber or noncombustible construction (no combustible light frame)
- No combustibles allowed in concealed spaces except those currently allowed in plenums (e.g., insulated wires, etc.)
- In Types IV-A and IV-B, floors must have minimum 1” noncombustible material above the mass timber
- Exterior mass timber walls must have at least one layer of 5/8” Type X gypsum board on the outside, and everything outboard of the mass timber is required to be noncombustible .

2024 IBC – 100% Exposed Ceilings

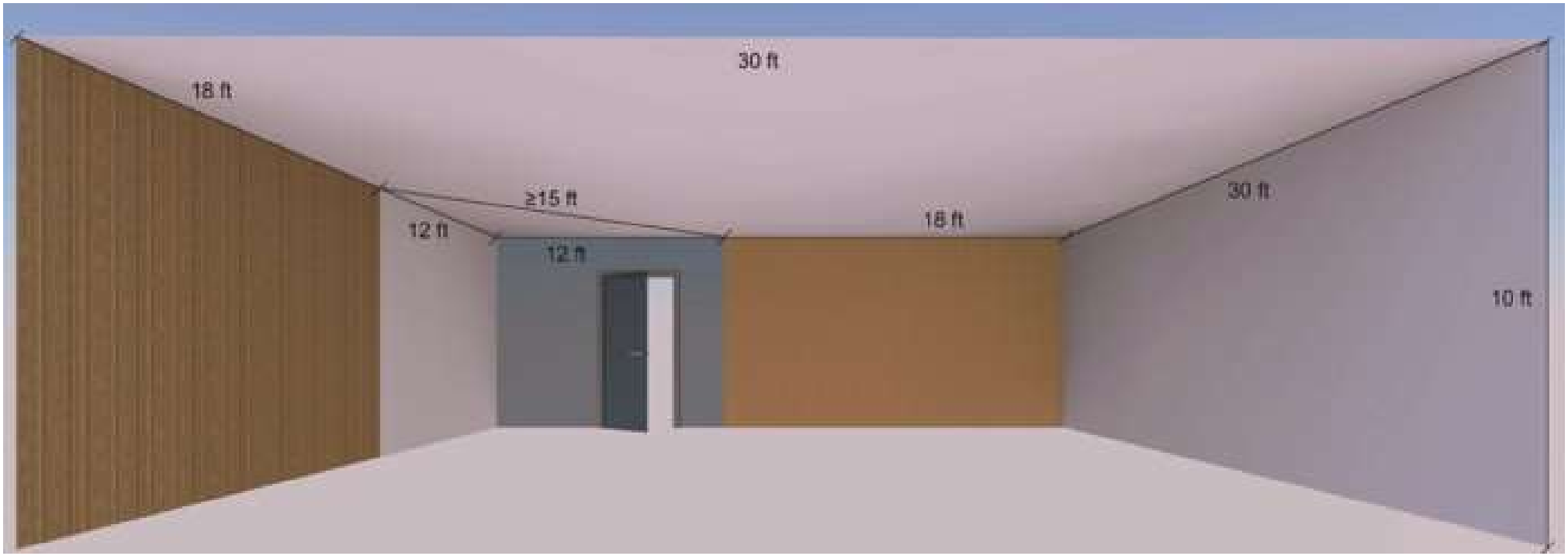
IV-B



Noncombustible protection in Type IV-B

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 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.

Changes in the 2024 IBC

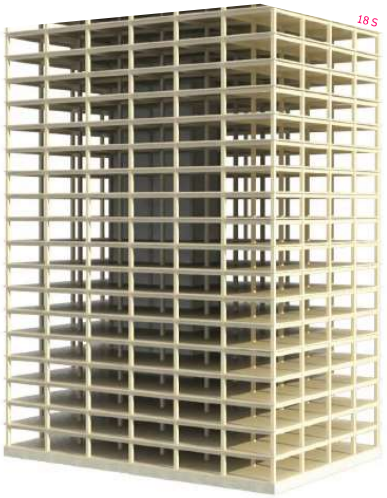


Additional Fire Protection Requirements

Requirements for fire protection during construction:

- Standpipes in accordance with IFC 3313
- Water supply for fire department operations
- One layer of noncombustible protection, if required, on all mass timber more than 4 stories below uppermost floor under construction
- Exterior wall coverings on all floor levels more than 4 levels below floor under construction – includes mezzanines

IBC Table 504.4 Allowable Stories Group B



18 STORIES
BUILDING HEIGHT 270'
BUILDING AREA 432,000 SF

TYPE IV-A

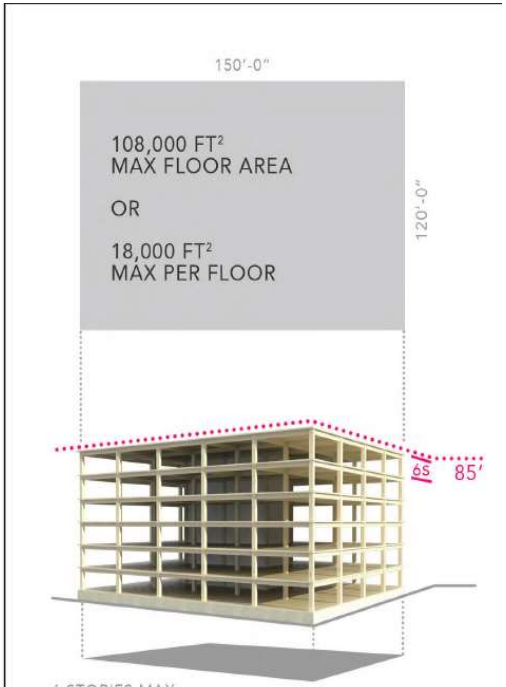
12 STORIES
BUILDING HEIGHT 180 FT
BUILDING AREA 288,000 SF

TYPE IV-B

9 STORIES
BUILDING HEIGHT 85'
BUILDING AREA 180,000 SF

TYPE IV-C

IBC 2021



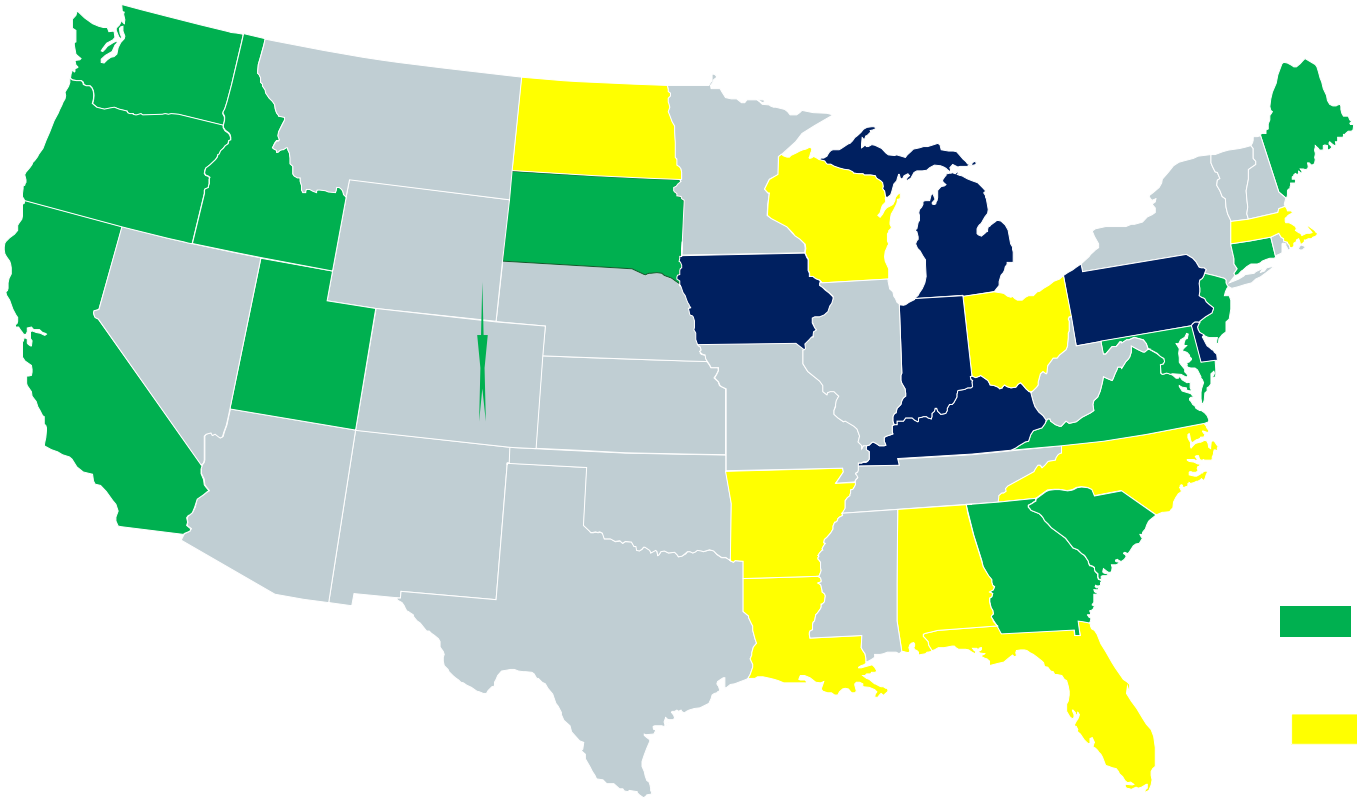
6 STORIES MAX
85'-0" MAX BUILDING HEIGHT
108,000 SQFT MAX AREA

TYPE IV- HT

IBC 2015

BUSINESS OCCUPANCY [GROUP B]

Tall Mass Timber Adoption Map



TMT Permitted/Effective Date

Regulatory Process Underway

Regulatory Process Pending

Questions/Discussion

DURING THE WEBINAR: please utilize Q&A function to be recognized or ask a question to be read aloud to the panel

AFTER THE WEBINAR: We will email responses to the anyone who has entered a question into the chat box but did not receive a response during the webinar. Email new or follow-up questions to jzakreski@iccsafe.org.