

# FIRE AND MASS TIMBER

“Large wood structural members are actually self preserving in fires. Possibility of fire safety with wood building is as good as any other kind of building.” *Craig Applegath, Founding Principal DIALOG’s Toronto Studio*

## HOW DOES MASS TIMBER PERFORM WHEN EXPOSED TO FIRE?

Mass timber provides inherent fire resistance through the formation of an insulating char layer when exposed to fire. The char layer protects the remain timber that is able to maintain the structural integrity of the building<sup>1,2</sup>. The rate of char formation is predictable with CSA O86-14 - Engineering Design In Wood suggesting between 0.65 to 0.8 mm/min<sup>3</sup>.

### WOOD CHARRING PROTECTS



The unburnt wood, protected by the charred wood, retains up to 100 percent of its initial strength.

Source: Fire Performance, reThink Wood

## TEST RESULT

A CAN/ULC S101 fire endurance testing has shown the capacity of Cross Laminated Timber (CLT) to provide reliable fire-resistance ratings up to **3 hours**<sup>2</sup> – one hour longer than code requirements in North America<sup>4</sup>.



## FUTURE RESEARCH

Other fire issues that have been identified for research include<sup>5</sup>:

- Fire properties of NLT, DLT, SCL, and other elements such as fire stopping and fire doors.
- Fire risk assessment skills in the mass timber field in Canada.

## REFERENCES AND RECOMMENDED READINGS

- <sup>1</sup>Fire Safety design in buildings (Canadian Wood Council)
- <sup>2</sup>Fire performance of cross-laminated timber assemblies - Revised edition (FP Innovations)
- <sup>3</sup>Ontario’s Tall Wood Building Reference (MNRF, 2017)
- <sup>4</sup>Fire performance of mass-timber encapsulation methods and the effect of encapsulation on char rate of cross laminated timber (NRC Publication)
- <sup>5</sup>Research and education environmental scan (Cobden, 2018)
- Summary of the fire protection foundation report - fire safety challenges of tall wood buildings (Barber & Gerard, 2015)
- Designing for fire protection (Think Wood)

### CONTACT US:



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