

Summary of the Mass Timber Demonstration Fire Test #5



Background

Mass timber is a renewable, nature-based structural material that is revolutionizing the building industry. Recognizing mass timber's vital role in achieving a low carbon built environment, the Canadian Wood Council and its partners are dedicated to advancing its use in construction.

The Canadian Wood Council partnered with federal and provincial governments to conduct a series of five separate fire research burns on a full-scale mass timber structure in Ottawa. The largest burn, of a 2-storey, 3,700 square foot structure, occurred on June 22, 2022. The remaining four burns in the series are scheduled to take place over the summer of 2022.

The purpose of the project is to support market acceptance of tall and large mass timber buildings in Canada. With the most certified sustainable forests in the world, Canada is a champion of sustainable forest management and in a position to solidify global leadership in the bioeconomy and forest sector by advancing mass timber adoption.





As one of a number of the fire test project sponsors, the Canadian Wood Council hosted a full-scale fire test at the Canadian Explosives Research Lab (operated by NRCan) in Ottawa on June 22, 2022.

Four additional tests will be performed over the course of the summer.



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Over 150 experts from across Canada, including fire officials, building regulators, insurance industry representatives, engineers, and architects, as well as wood industry and NRC fire research experts, witnessed the unique event to learn about and observe the behaviour of mass timber construction exposed to fire.



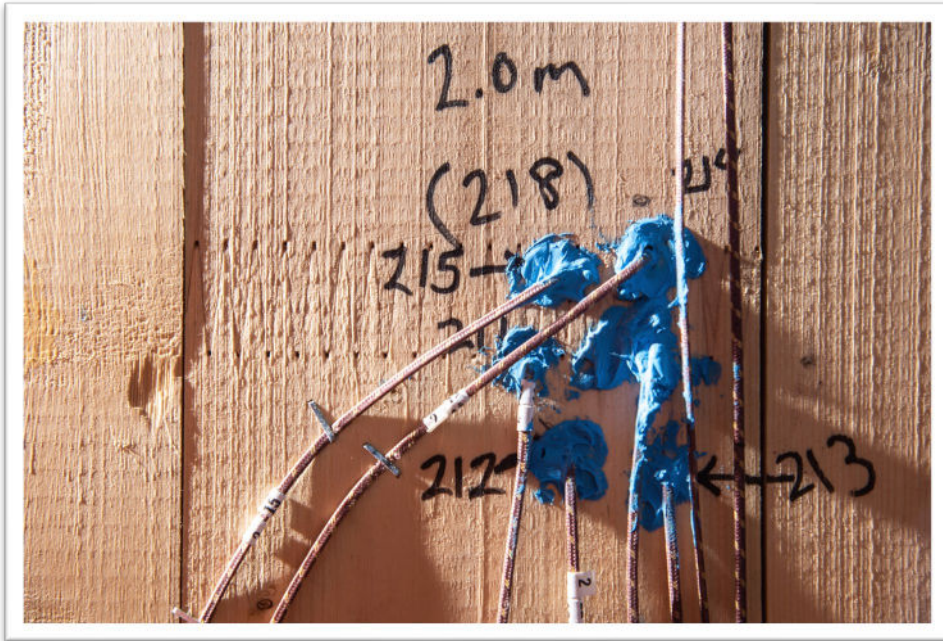
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Thank you to the Ottawa Fire Service professionals on hand to support the test and ensure the safety of all attendees.



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As a research test, the structure was instrumented with 400 thermocouples and radiation sensors to capture information documenting the fire development.





The information provided by the sensors is expected to validate the resistance of exposed / unprotected mass timber elements to fire.

Reports and videos of this test and the four subsequent tests happening over the summer will be available this fall at:

firetests.cwc.ca



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Ignition of the test fire. The fuel load simulated a typical open office layout, including mocked-up cubicle-style workstations simulated using wood products as a fuel.

A number of elements within the structure were protected by gypsum board, however, the mass timber ceiling, beams, and columns, as well as a CLT wall, were exposed.





The mass timber structure during the fully developed fire.



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Once the fuel load (mock furnishings) of the building were consumed, the fire quickly died down and burned out.



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The fire on the burning structural elements largely self-extinguished within the first hour, however, the test was continued for a full four hours to monitor for any potential re-ignition.



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The mass timber demonstration fire test performed as expected, showing the capacity of the burning timber structure to allow for fire decay while surviving full burn-out with this type of fire scenario.

It can be concluded the fire performance of the mass timber structure was similar to that of non-combustible construction in a similar fire scenario and confirms that mass timber can perform well under the very rare fire scenario in which the sprinkler system fails and the fire department is unable to respond.



For Updates and Additional Information Please Visit the
Mass Timber Demonstration Fire Test Program Website

firetests.cwc.ca



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