



# THE FIRE PROTECTION RESEARCH FOUNDATION

## Fire Safety Challenges of Tall Wood Buildings Project Summary

### Background

Recent architectural trends include the design and construction of increasingly tall buildings with structural components comprised of laminated wood referred to by names including; cross laminated timber (CLT), laminated strand lumber (LSL), or glued laminated timber (Glulam). Construction is currently underway on a 10-story apartment building in Melbourne, Australia, with taller structures up to 30 stories under design in Norway, Austria and Vancouver. These buildings are cited for their advantages in sustainability resulting from the use of wood as a renewable construction material. Claims have been made that they are actually safer than buildings fabricated using structural steel due to the formation of an insulating char layer that forms on the perimeter of a laminated wood beam when exposed to a fire.

The performance of these buildings under credible fire scenarios needs to be assessed to ensure the safety of the occupants to emissions and thermal hazards, as well as the property protection of the building and nearby structures. This performance characterization should include consideration of functioning, and partially or fully impaired fire protection systems.

### Overall Objectives

1. Characterize the fire performance of tall wooden structures.
2. Define the necessary design and material requirements to achieve a level of safety and property protection equal to or above steel structures.
3. Communicate the results to serve as a guide for architects, engineers, and code officials.

This is a two phase project. The tasks outlined below are for a Phase I proposal literature review and gap analysis.

### Phase I Tasks:

#### Task 1 Literature Review

- a. Global design case studies of high rise (six stories and above) timber framed buildings (design and timber component features)

- b. Recent research studies focused on the fire performance of high rise timber framed buildings and or other relevant research
- c. Fire test data on timber structural components and relevant fire incidents

#### Task 2 Gap Analysis

Based on Task 1, identify gaps in available information:

- i. additional component and subsystem tests needed to assess structural performance
- ii. credible fire scenarios to evaluate (through analytical or testing means) the consequences in tall wood structures, including potential life safety and economic impact

#### **Reporting and Deliverables:**

This research program will be conducted under the auspices of the Fire Protection Research Foundation under the direction and guidance of Project Technical Panel. The final report will be issued in November 2013.