AS-BUILT SINGLE NAILED BATTEN TO RAFTER CONNECTIONS WERE TESTED UNDER FLUCTUATING DYNAMIC LOADS DETERMINED FROM A WIND TUNNEL STUDY. USING CONNECTION TESTING DATA, NON-LINEAR TIME-HISTORY STRUCTURAL ANALYSIS WAS PERFORMED ON A SECTION OF A ROOF TO CAPTURE THE EFFECTS OF LOAD SHARING AND REDISTRIBUTION DURING NAIL SLIPS AND PROGRESSIVE FAILURES.

- Batten to rafter connection are vulnerable to failures under wind loads and are a common failure mode seen in damage investigations.
- Light framed timber roof structures are complex and as connections weaken or fail, loads are redistributed to neighbouring connections, potentially overloading them and causing a cascading or progressive failure to initiate.
- This study aims to understand the load redistribution and progressive failure mechanisms of these connections under wind loads.
- Outcomes of this work include developing improved fragility curves and cost effective retrofitting methods that prevent failures from propagating.