



## SEISMIC EVALUATION AND RETROFIT OF WOOD BUILDINGS

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### **ABSTRACT:** Buildings

The seismic evaluation of an existing wood building involves an investigating to determine if the structure meets pre-defined target structural performance levels. The main goal is to ensure that building collapse does not occur, thus the risk of death or injuries to people are minimized. The seismic evaluation process will also determine which are the most vulnerable and weak components and deficiencies of a building for the expected types of earthquakes in the region. In contract, the purpose of the seismic rehabilitation process is to improve seismic performance and correct structural deficiencies by increasing strength, stiffness or deformation capacity and ensuring adequate connections between structural members. A proposed retrofit scheme will be successful if it results in an increase in strength and ductility capacity of the structure that is greater than the demands of strength and ductility imposed by actual earthquakes that may occur during the lifetime of the building.

Although wood-framed buildings have generally performed well during past earthquakes in North America, various degrees of damage have been reported in many buildings. The lessons learned from these earthquakes have led to an improvement in the design codes and construction practices over the last three decades. However, many existing buildings are still vulnerable, as these were designed in accordance with older codes or constructed using old construction practices that today are not considered suitable for adequate earthquake performance. The most common construction type in Canada is wood frame construction, and there is a large inventory of these buildings that are old, were built prior to the introduction of seismic design requirements, and have not been retrofitted to resist severe ground shaking. Therefore, there is a need to develop tools to assess the seismic vulnerability of the exiting wood-framed buildings in Canada.

The study discussed herein presents a proposed approach to adapt the recommendations for seismic evaluation and retrofit of wood frame structures presented in Chapter 12 of ASCE 41-13 for Canadian seismic design practice. A discussion of the specification for data collection procedures for obtaining material properties and performing condition assessments; general assumptions and requirements; modelling procedures, component strengths, acceptance criteria, and retrofit measures for wood shear walls and diaphragms; requirements for wood foundations; and requirements for other wood components, is presented. Well-established methods for effective retrofit wood frame buildings are presented and discussed.