Abstract

The Midply™ triple-leaf shear resistive wall is designed by FPInnovations and UBC to be employed in mid-rise wood building. Compared to double-leaf structures, this wall has a weaker low-frequency sound insulation due to the additional resonance created by the middle-leaf. The original contribution of this thesis is developing a method to predict the air-borne sound transmission through triple-leaf walls, which can incorporate perforated plates. The model is based on a modified Transfer Matrix Method (TMM) that accounts for the losses at the perimeter of the finite cavity. The air-borne sound transmission tests performed on simplified small-scale structures showed that the modified TMM model has acceptable predictions in most frequencies, although Statistical Energy Analysis (SEA) was superior for high-frequency predictions. The research suggests that the sound insulation in triple-leaf structures could be improved through careful perforation of the middle-leaf, which is suggested for future work.