

Prediction and Control of Rolling Noise in Buildings

New buildings in urban areas are divided into commercial and habitable areas. This use has revealed critical disturbances due to the noise generated by rolling delivery carts when the buildings are mainly occupied (e.g. early in the morning). These carts generate vibrations at low frequencies (below 100 Hz) that propagate easily throughout the building structure and on the upper floors, disturbing the habitants therein.

The aim of this thesis is to develop an original model for rolling noise in buildings, taking into account the roughness of the ground surface and the roughness profile of the wheels. The model will also consider the mechanical impedance of the ground, including possible treatment of floor noise, and will be validated by comparison with experimental data. Additionally, design guidelines will be defined for developing new vibration control solutions, as well as requirements to overcome the problem of rolling noise in building construction.