

RESEARCH PROJECT ON THE REDUCTION OF NOISE PRODUCED BY GARAGE DOORS IN MULTIPLE HOUSING PROJECTS

Introduction

The noise produced by the opening and closing of garage doors in multiple housing projects is often a source of annoyance. The purpose of this study was to examine, under real conditions, the noise transmitted into living quarters located above the garage entrance. The noise transmission was evaluated at the time of opening and closing doors equipped with anti-vibration devices.

Anti-vibration Devices Tested

The tested anti-vibration devices described in this research report were chosen for their cost and because they can be installed by qualified garage door installers who do not specialize in acoustics or noise control. The devices were to provide sufficiently firm support to avoid excessive movement of the tracks and the mechanism during the operation of the doors. This last condition is usually required by most garage door suppliers and installers for them to guarantee the cushioned doors by a warranty equivalent to that for doors installed without anti-vibration cushioning.

Results

The limited data collected during this study indicate that it is possible to reduce the average noise produced by opening and closing garage doors by approximately 7 to 13 dB(A), by reducing the mechanical coupling between the door components and the building structure. For manually operated garage doors, this is a matter of inserting neoprene cushions at the attachment points of the door tracks to the structure. For mechanically operated doors, in addition to the door tracks, it is necessary to equip the door's drive mechanism with neoprene cushions. According to the study results, the mechanical doors are less noisy than the non-mechanized doors.

In concrete buildings, the cushioning of the garage door tracks and mechanisms should allow the door's operating noise to be reduced in the living quarters situated directly overhead to an average noise level in the range of NC 25; this level corresponds approximately to the ambient noise level measured by NRC in approximately 600 homes across Canada (see Graph 1). The average noise level transmitted to

the apartment situated above a mechanized or manually operated door, installed as indicated in a wood-frame construction, exceeds the interval corresponding to the standard deviation of the average ambient noise level measured in Canadian homes by NRC for the 125 and 250 Hz octave bands (see Graph 2) and is therefore more likely to cause annoyance.

Figure 1
Installation of the suspension tracks and garage door raising mechanism

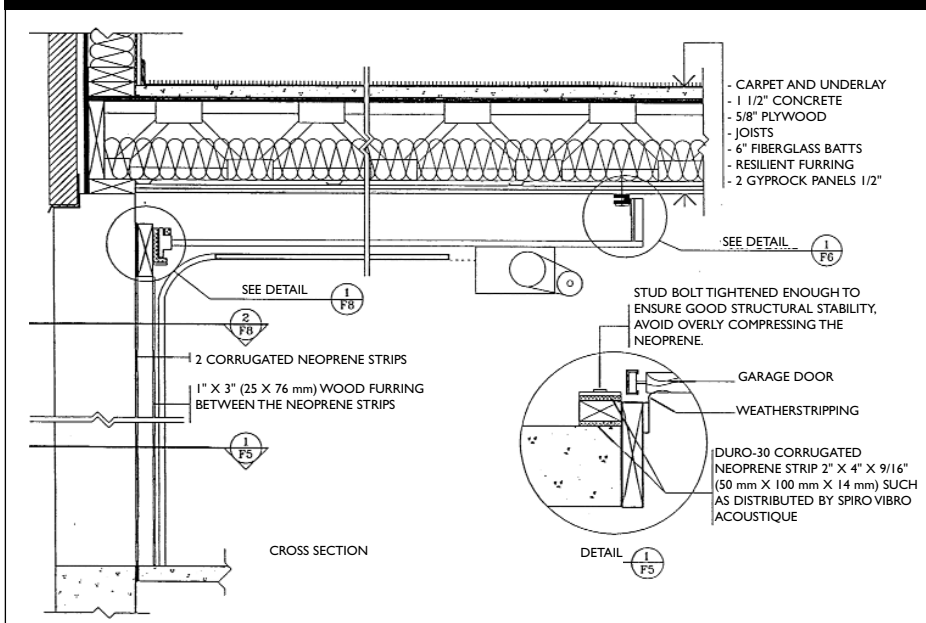
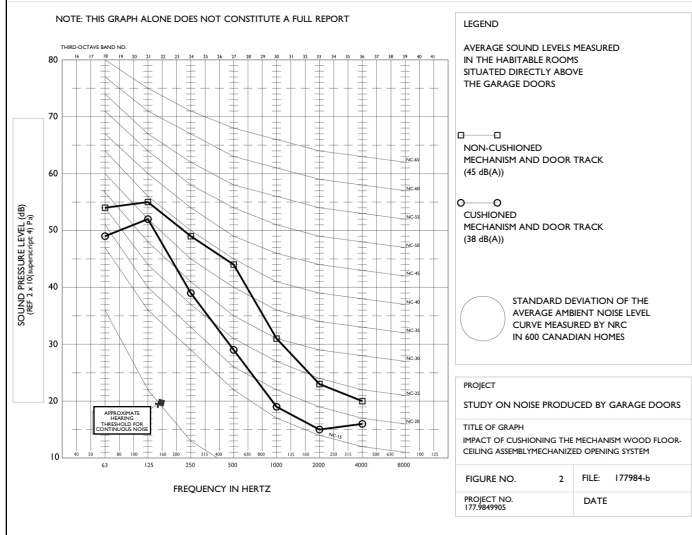


Figure 2
Study on Noise Produced by Garage Doors



Contribution to the Multiple Housing Construction Sector

The noise produced by the garage door in a multiple housing project constitutes a significant source of annoyance for the occupants of the units situated directly overhead. The installation methods described in this research project attenuate the noise radiated into the units by 7 to 13 dBA when the door is operating, while also providing solid support for the tracks and the mechanism.

Considering the funds available for the research, the optimization of the anti-vibration devices described in this report and the identification of the exact amount of soundproofing material derived from each device were not part of the objectives for this research project. These topics should be addressed in a later study conducted in a controlled research environment. Higher attenuation may be achieved with more flexible anti-vibration devices or by installing the door in a frame separated from the building's structure.

Project Manager: Sandra Marshall

Research Report: Research Project on the Reduction of Noise Produced by Garage Doors in Multiple Housing Projects

Research Consultant: Michel Morin, MJM Conseillers en acoustique inc.

A full report on this project is available from the Canadian Housing Information Centre at the address below.

Housing Research at CMHC

Under Part IX of the National Housing Act, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research.

This fact sheet is one of a series intended to inform you of the nature and scope of CMHC's research report.

The **Research Highlights** fact sheet is one of a wide variety of housing related publications produced by CMHC.

For a complete list of **Research Highlights**, or for more information on CMHC housing research and information, please contact:

The Canadian Housing Information Centre
 Canada Mortgage and Housing Corporation
 700 Montreal Road
 Ottawa, ON K1A 0P7

Telephone: 1 800 668-2642

FAX: 1 800 245-9274

OUR WEB SITE ADDRESS: <http://www.cmhc-schl.gc.ca/Research>