The Efficiency of Cluster Barrier Building Organization in Reducing Traffic Noise in the Built Area

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Abstract

This paper studies the effect of barrier building organization and noise receiving point locations relative to a street (source line) on traffic noise attenuation between the buildings in the built area facing busy street which is considered as (linear finite-length sound sources). The objective of the research is to study the variables affecting the attenuation values of traffic noise in receiving points between and behind the buildings in an urban environment overlooking busy streets. A theoretical background of sound wave penetration between buildings facing streets in general is presented. In addition to study, the variables affecting noise attenuation behind groups of barrier buildings. Mathematical models have been proposed to calculate the traffic noise attenuation values in different receiving points located between and behind barrier buildings facing traffic noise.

Computer simulation of three types of cluster barrier buildings, each type consist of two case studies with different receiving point locations relative to street are studied to explain the effect of different building organization types the ratio of gaps in barrier buildings and its distances from the street (source line) on noise waves penetration to the built area. Results of this study indicate that the form of cluster building type, its location, direction and receiving point location affects the exposure degree of the receiving points to the noise source line behind these building which in turn affects traffic noise attenuation values. It is concluded that the

solidity form of some cluster building and its distance far from the first row of barrier buildings will increase the traffic noise attenuation values in built area behind barrier buildings.