

THE EFFECT OF BARRIER BUILDINGS GAPS ON TRAFFIC NOISE ATTENUATION IN THE BUILT ENVIRONMENT

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ABSTRACT

This paper studies the performance of specific barrier buildings organization types when exposed to linear finite-length sound sources (e.g. traffic noise) as means of noise attenuation to prevent sound waves from penetrating through the gaps between the barrier buildings to the built area behind them.

A theoretical background of sound waves Attenuation in general and traffic noise spreading paths from the source to the built area behind barrier building in particular is presented, in addition to the impact of barrier buildings gaps on noise penetration to the built area facing traffic noise.

Mathematical prediction method is applied in the practical part of the study to calculate traffic noise attenuation values in built areas behind the buildings. Computer simulations of twelve mathematical models are used as case studies to analyse the effect of different buildings organization types on their exposure degree to traffic noise.

The objective of the research is to study the effect of barrier buildings organization (type of grouping) on the length of buildings gaps exposed to the traffic noise and its effect on noise penetration between and behind those buildings.

Key words: building barrier organization, environmental acoustics, sound waves attenuation, sustainable buildings, and traffic noise barriers.