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TRAFFIC NOISE MEASUREMENT AND PREDICTION OF THE BARRIER EFFECT ON TRAFFIC NOISE AT DIFFERENT BUILDING LEVELS

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Abstract

With the development of transportation systems, the associated traffic noise problem has drawn more and more attention in Hong Kong. Under the Hong Kong Planning Standards and Guidelines, a standard of 70 dB(A), measured as L_{A10} (1 hour), has been set for road traffic noise. The Calculation of Road Traffic Noise (CRTN) method has been adopted in Hong Kong to estimate such noise. This study first examined and evaluated the accuracy of this method in predicting traffic noise at different floor levels of a building in Hong Kong. Traffic noise was measured at different floor levels, and both the predicted and measured L_{A10} showed a similar trend: the higher the floor level, the lower the traffic noise level. The predicted L_{A10} at the building façade, however, tended to be overestimated with a mean difference of +2.6 dB(A) between the predicted and measured results. A correlation coefficient (R^2) of 0.8167 between the predicted and the measured L_{A10} indicates that the predicted levels correlated closely with the measured levels. Second, traffic flow measurements were also recorded at four different locations. The results indicate that the predicted L_{A10} at all floor levels of the four buildings in these four locations exceeded the benchmark of 70 dB(A) when no roadside barrier was in place. The noise level reduction after installing the barrier varied from 17 dB(A) to 0.2 dB(A) at different floor levels of the four buildings. The CRTN is therefore a useful tool in predicting and controlling traffic noise levels at different floor levels at the planning stage.

Key words: buildings, Calculation of Road Traffic Noise, sound pressure level, traffic noise

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