

Study on Prediction Model of Railway Noise at High-rise Buildings

Kiyoshi NAGAKURA Yufuko ABE Toshiki KITAGAWA Yukie OGATA

This paper introduces a prediction model of the railway noise applicable to various locations including high-rise buildings. In order to prepare a model adequate for prediction of noise at high-rise buildings, the vertical directivity of a noise induced by a passing train and multiple sound reflections between noise barrier and car surface should be taken into consideration. Firstly, the vertical directivity pattern of the noise radiated from the lower parts of a vehicle was investigated through both a field measurement and a scale-model test, and its empirical formula was derived. Next, the effect of multiple sound reflections between noise barrier and car surface was examined by an acoustic experiment with a scale model, the result of which indicated that the multiple sound reflections could be simulated by using an image sources model. Finally, a prediction model using the empirical vertical directivity pattern and the image sources model has been proposed and the prediction result by the model has been validated to be consistent with the result of the scale model test.