

**Dynamic Response Characteristics of the Tall Noise Barrier on Railway Structures  
during Passage of Trains and Its Design Method**

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The tall noise barrier recently installed on Shinkansen structures has a low natural frequency; therefore, it may resonate with dynamic loads such as the train wind which has not been a crucial condition for design. The aim of this study is to evaluate the dynamic response characteristics of the noise barrier and to propose a dynamic design method of the noise barrier on the basis of measurements and numerical analyses. As a result of the study, it has been found out that the dynamic response of the noise barrier excited by the train wind consists of the resonance effect between pulse excitation of the train wind and the natural frequency of the noise barrier and the overlapping effect of the tail pulse of passing train. Methods to generalize the resonance effect by a multi-body system and the overlapping effect by the free vibration theory of the SDOF system have been proposed. In addition, two design methods have been proposed: a precision method based on simulation and a simplified method. The range of application of  $1.0\text{kN/m}^2$  previously used as the design load has been made clear on the basis of the natural frequency of noise barrier.