Monitoring Method of Soundness of Railway Bridge Piers across a River

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The soundness of the structural stability of railway bridge piers across a river deteriorates over time because the riverbed and overburden that support the piers can be gradually eroded by river flows. An inspection of the soundness is carried out by measuring the natural frequency of a primary mode derived from the free vibration of the piers generated when an impact force is applied to them through a field test. On the other hand, it is expected that a long term monitoring method improves efficiency in the inspection compared with the field test. In this study, soundness indices for the long-term monitoring with the area ratio of the acceleration power spectrum of microtremors and the ratio of the amplitude of acceleration during train passage were proposed through experimental model tests and in situ measurements. Consequently, it was confirmed that there was a correlation between the indices and the natural frequencies of piers. In addition, the soundness evaluation of the piers was performed by the indices obtained from the long term monitoring.