

**Evaluation Method of Safety Factor Against Falling Lining Concrete
with Vibration Spectrum at Hammering Test**

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This paper describes hammering tests with specimens simulating tunnel lining and shows that the decay time tends to be long and a peak in the eigen frequency was clearly identified in case of the specimen with one inner cavity. Three-dimensional numerical calculation was also carried out and the results were compared with the hammering test results. It reveals that the existence of an inner cavity causes clear peaks in the spectrum and the peak frequency is influenced by its shape. This paper also proposes the method to evaluate the safety factor against falling lining concrete by comparing the shear force acting on the crack surface with its shear strength.