

## Non-Destructive Inspection for Tunnel Lining Concrete with Small Void by Using Ultrasonic

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**Abstract :** Many tunnels which have been constructed since more than 50 years were existing in Japan. Lining concrete in these tunnels have many problems such as crack, flaking and void. Inner void between lining concrete and rock was very hard to find by outside visual check and hammering test. In this paper, non-destructive inspection by using ultrasonic was applied to investigate inner void. A model concrete with inner void was used as specimen and ultrasonic inspection was applied to specify the location and the size of void. As a result, ultrasonic inspection could accurately find the inner void.

**Keywords :** tunnel, lining concrete, void, non-destructive inspection, ultrasonic

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