Pipeline inspection and investigation of life extension plan by Impact elastic wave inspection method (Fukuoka City)

Year of Research	2012	Appropriate stock management

(Purpose)

The population saturation level of sewage is reached 99.5% and total construction length is 6,900km in Fukuoka city. Due to the increase of aged pipeline, appropriate maintenance and treatment is required. Although judgment of treatment method was done by qualitative inspection, to evaluate pipe strength was subject.

In this research, impact elastic wave inspection method was employed as quantitative diagnosis technique in order to identify the aging degree of pipe quantitatively. Following life extension flow, effectiveness of quantitative diagnosis was shown. And relation between aging year of pipe and results of impact elastic wave inspection method was also investigated.

(Results)

(1) To grasp the deteriorations of pipes, the research addressed the following:
Pipe:Reineforced concrete pipe (Class 1), Inner diameter:250-700, Total length:3674.91m
30-40 year aging pipe length:113.96m, 40-50 year aging pipe length:869.78m, over 50 year aging pipe length:2691.17m

(2) There were 10 spans defined as urgency Ⅰ and Ⅱ in 93 spans by CCTV inspection. On the other hand, there were no urgency Ⅰ and Ⅱ spans by impact elastic wave inspection that structural deterioration was not found.

(3) Concrete strengths was calculated by using impact elastic wave inspection results for 3 spans which was needed to be reconstruct and structural calculation was carried out that 2 spans in 3 span could be possible to select composite pipe. From this result, cost includes construction and inspection became 10% less than that of selected self support type for 3 spans.

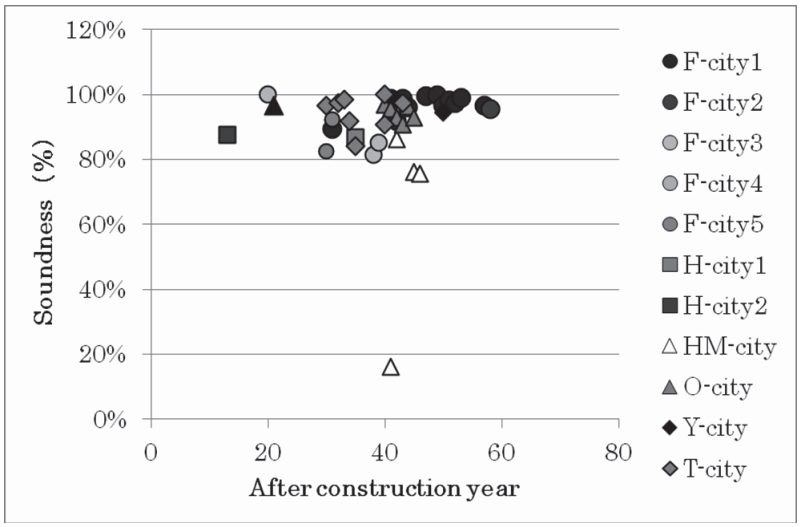

Fig.1 Relation between soundness and aging year

(4) Measurement aging pipe data obtained from multiple cities showed that there were no relation between aging year and pipe soundness. However, used over 50 years pipe had still higher soundness that those facilities could be continuously used.

(Conclusion)

The usage of impact elastic wave inspection in making a life extension plan was effective. Further study is scheduled to investigate the application method for life extension plan.

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