Empirical Studies of B-DASH Project (Sewer Management System Technology)

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1. Introduction

In order to prevent road cave-ins and similar disasters resulting from damage to sewers, and to extend the life of sewers, efforts are being made to implement systematic inspections and surveys. However, it is difficult to deal with an enormous amount of sewer stock under the severe financial condition of local governments and the daily working volume in the current TV camera survey. It is, therefore, strongly required to develop an efficient survey method by combining various existing sewer inspection technologies.

2. Breakthrough by Dynamic Approach in Sewerage High Technology Project (B-DASH Project)

MLIT started the Dynamic Approach in Sewerage High Technology (B-DASH) Project in fiscal 2011. In fiscal 2013, in order to reduce maintenance costs and improve the ratio of inspections and surveys conducted, a research agreement on validating sewerage management technology was executed with 3 joint research organizations.

3. Outline of the sewer management system technology

(1) In-pipe camera inspection, wide-angle view camera survey, and profiling technology

This technology is for in-depth study using a wide-angle camera and path shape profiling system after screening sewers with major abnormality using an in-pipe camera and a conductance meter. (Kansei Kogyo Co., Ltd., Nissui Con and Hachioji City Joint Research Organization)

Figure 1: In-Pipe Camera

(2) Wide-angle camera survey and shock elastic wave inspection technology

This technology screens sewers with major abnormality using a wide-angle camera capable of detecting the in-pipe condition efficiently only with direct-view driving mode, and then examines the detected sewers to calculate the load bearing capacity of pipes by shock elastic wave inspection method and determine control measures. (Joint Research Organization of Sekisui Chemical Co., Ltd., Urban Infrastructure Technology Center Foundation, Kawachi-Nagano City and Osaka Sayama City)

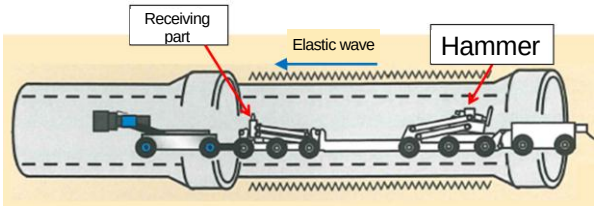

Figure 2: Image of Shock Elastic Wave Inspection Method

(3) Advanced image recognition technology

This technology contributes to labor-savings and efficiency improvement in surveys by using a power-loaded self-propelled TV camera capable of spherical imaging without stopping, learning-type automatic defect detection, and defect detection by laser projection. (Joint research organization of Japan Sewage Works Agency, NEC Corp., and Funabashi City)

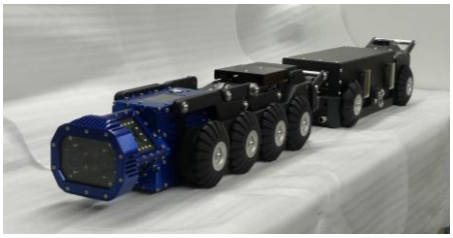

Figure 3: TV Camera with Advanced Image Recognition Technology

4. Utilization of findings from empirical studies

NILIM clarified the efficiency and required performance of surveys done with each of the aforementioned three technologies by comparing daily progress, survey costs, detectable defect items, accuracy, scope of application, applicable conditions, etc. with conventional survey methods. In the future, we plan to formulate guidelines (draft) for efficient surveying of sewers using these 3 technologies, which we hope will serve as a reference for local governments, survey companies, and equipment manufacturers.

[Reference]

http://www.nilim.go.jp/lab/ebg/index.htm