

# A Case of Utilizing Results

## The Technique of Planned and Effective Investigation and Judgment of Sewer Pipes

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### 1. Introduction

Recently the number of decrepit pipes is increasing; therefore there are growing concerns about occurrences that has a serious influence on social activities and daily lives, such as road cave-ins and stop of sewage services. To prevent these accidents, it is an important issue of municipality to make and follow the maintenance management plan for prevention and preservation, and the adequate practice of reconstruction and repair. On the other hand, along with the strained state of municipal finances, the rate of annual sewer pipe investigations is as low as 1% of total extension. Therefore more effective investigation methods of sewer pipes are necessary.

To prolong the lifespan of facility, the precise grasp of the present state of degradation (substantiality) is required. However, the length of underground vinyl pipes that consist 60% of the length of total sewer pipes, we do not have much knowledge of deficiency nor of the mechanism of degradation. And there is concern that we do not have degradation judgment criteria compared to other materials. Based on this, National Institute of Land and Infrastructure Management has proceeded these two researches towards the promotion of maintenance management of prevention and preservation to prevent the fatal damage of sewer pipes and the adequate practice of reconstruction and repair.

- ① Screening research method by utilizing pole camera.
- ② The standardization of degradation judgment of vinyl pipes, etc.

### 2. The Research of Screening Method by Utilizing Pole Camera

A pole camera is a piece of investigation equipment that has an extendable operation pole with a camera and light on its top. (photo1) We can inspect and investigate sewer pipes by inserting the pole into a manhole and using zoom functions while staying on the surface. The merit is that the cost of this form inspection is lower than the present detail inspection (TV camera inspection) and more sewer pipe investigations are conducted during a short term. We determined the range of camera eyesight by using experiment instruments and grasped the trend of deficiency that

happens inside a pipe and estimated how much deficiency the pole camera can detect. Based on these results we evaluated the systematic screening method by combining the present detail inspection (TV camera inspection) and the pole camera. We developed a more effective judgment method for accurate investigation, daily progressing amount and expense.

### 3. Standardization of Degradation Judgment of Vinyl Pipe, etc.

NILIM is experimenting to grasp of capability of vinyl pipes with deficiencies. We are also making the judgment criteria of vinyl pipes based on the trend of the deficiency (photo2) through the results of present TV camera inspection, etc. In the judgment criteria, we are going to include the appraisal method of the cracks that occur following the axis, flattening and the deformation that are characteristic for vinyl pipes instead of conventional judgment of reinforced concrete pipe. The result of this study will be proposed into the guide of sewage maintenance management we are considering to revise.



Photo1 Pole camera



Photo2 Example of damage to a vinyl pipe

### 4. Summary

By utilizing these research results, fatal damage of sewer pipes that are caused by road cave-ins can be avoided, the extension of endurance and the reduction of maintenance management cost are expected.