Analysis of Abnormalities in Sewer Pipes Contributing to Stock Management

(Study period: FY2014 to FY2016)

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1. Deterioration of sewer pipes and efficiency increase of maintenance

Total length of the sewer pipes laid across the country is about 470,000 km as of the end of fiscal 2015, while more than 3,000 cases of road subsidence resulting from sewer pipes occur every year. Therefore, there is a concern about rise in the risk of a serious accident resulting from deterioration of sewer pipes, such as road subsidence. Since preventive maintenance is required for prevention of road subsidence, "screening" for increasing the efficiency of maintenance is attracting attention.

2. Road subsidence caused by sewer pipe deterioration

With the "Nationwide Survey on Road Subsidence resulting from Sewer Pipes," which started in fiscal 2006, NILIM analyzed the status of road subsidence resulting from sewer pipes and its relationship with the trend of problems with sewers in order to increase the efficiency of sewer pipes maintenance. **Figures 1** and **2** provide the results of analysis on the trend of road subsidence resulting from joint displacement according to the elapsed years and the year of laying by dividing the decade data from 2005 into the first 5 years and the last 5 years. As the trend, peak was different in the elapsed years but was almost the same in the year of laying. **Figures 3** and **4** show the results of aggregation of data on the percentage of abnormality (joint displacement) according to the elapsed years and the year of laying by classifying abnormalities according to the year groups of changes in sewer standards, and an almost constant trend was confirmed with the ratio of abnormalities according to year groups for both elapsed years and the year of laying.

3. Study findings

It was found that the trends of road subsidence and deterioration are closely related to the sewer standards as well as the elapsed years of pipelines. Deterioration of pipes has been discussed so far based on the elapsed years. Then, efficient screening with additional condition of sewer standards is expected to promote preventive maintenance for the prevention of road subsidence.

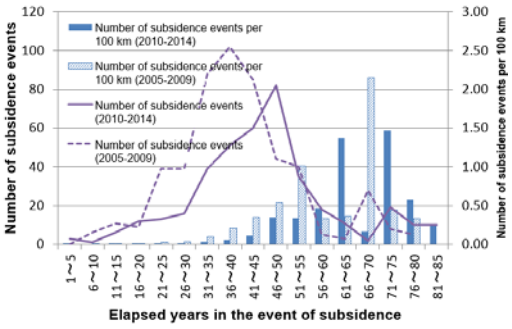

Figure 1: Number of subsidence events by elapsed years (joint displacement)

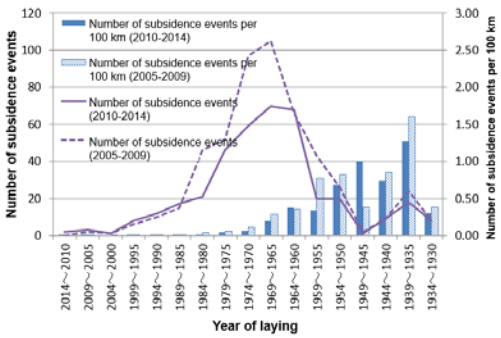

Figure 2: Number of subsidence events by year of laying (joint displacement)

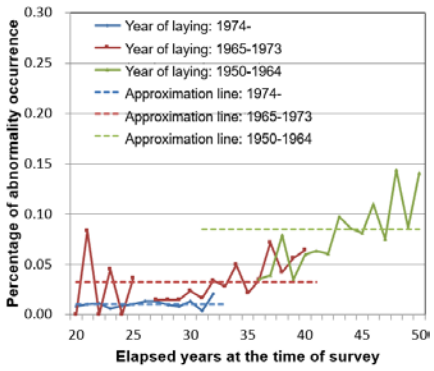

Figure 3: Percentage of abnormality by elapsed years (joint displacement)

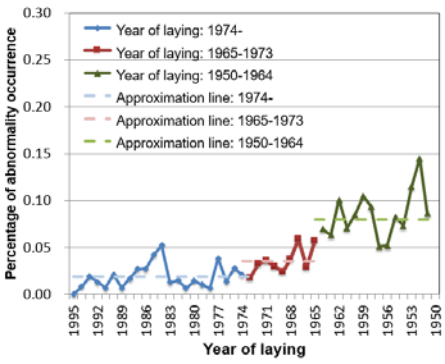

Figure 4: Percentage of abnormality by year of laying (joint displacement)