

Performance evaluation of manhole cover and research of proper maintenance scheme

Year of Research

2012 • 2013

Appropriate stock management

(Purpose)

Fukuoka city has about 146,000 manhole covers and is struggling to maintain. The number of manhole cover is increasing due to the progress of the sewage facility construction. This result lead to the increase of maintenance cost that the introduction of new maintenance method is required according to the cover shape, setting condition and elapsed years.

In this study, the setting condition of manhole cover is grasped, and test about cover specification and function was carried out. From the test results, basic information for the evaluation of manhole cover was obtained and basic principal of maintenance scheme was investigated.

(Results)

(1) Gather the information and arrange

For maintenance, information about manhole cover property and risk was gathered and arranged. From arranged property information, cover pattern, structure of reverse side, setting year, support structure, performance and function was categorized and transition table was made.

(2) Check and inspection of manhole cover

Check and inspection was carried out about 42 manhole covers. Check and inspection was conducted not only surface but also reverse. Basic information, open and shut movement and cover condition was investigated.

Check and inspection point was consisted of the lack of function and performance deterioration. Especially about performance deterioration, visual inspection about cover surface and reverse, condition of frame was conducted.

Measuring the height of patter and the gap between cover and frame is done. If corrosion of reverse side was confirmed, measurement of residual thickness was conducted after remove of the corrosion layer at ribs.

(3) Performance validity test of existing manhole cover

1. Appearance, shape, size and mass

Check about the transition of appearance and shape due to aging and setting condition was confirmed.

2. Breakage prevention performance

Load-carrying capacity test and material test obtained from cover sample was conducted to confirm the breakage prevention performance. Displacement and stress was employed as load carrying capacity indices.

3. Slip prevention performance

To confirm the slip prevention performance, slip resistance performance test was carried out. DF tester R85 was used. DF85 tester was introduced for the use of manhole cover measurement. DF85 tester was improved DF tester was employed in ASTM standard as slip resistance measurement devise. Under the test cover surface was kept wet and measured the slip resistance at 60km/h condition.

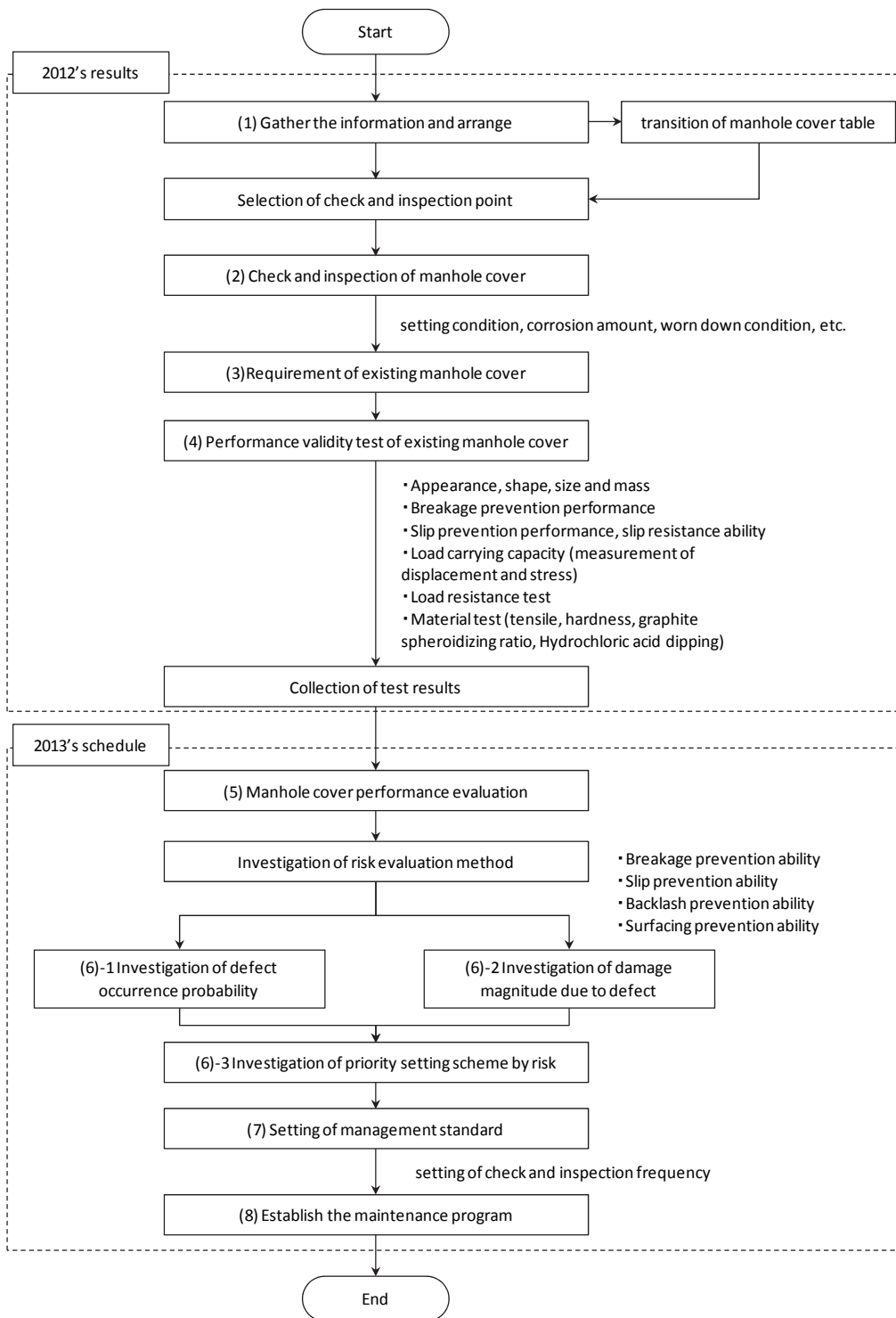


Fig.1 Research flow

(Future subject)

In 2013, manhole cover performance evaluation will be conducted by 2012's results and investigation about life extension plan will be established.

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Key words

Manhole cover, Life extension plan, Maintenance planning