

Study on improvement of maintenance of manhole and manhole cover

Whole term

2005.6 ~ 2007.3

(Purpose)

Sewerage systems in Japan are said to have 11 million manholes. Three types of serious accidents and/or inconvenience with respect to manholes are brought to our attention in recent years :

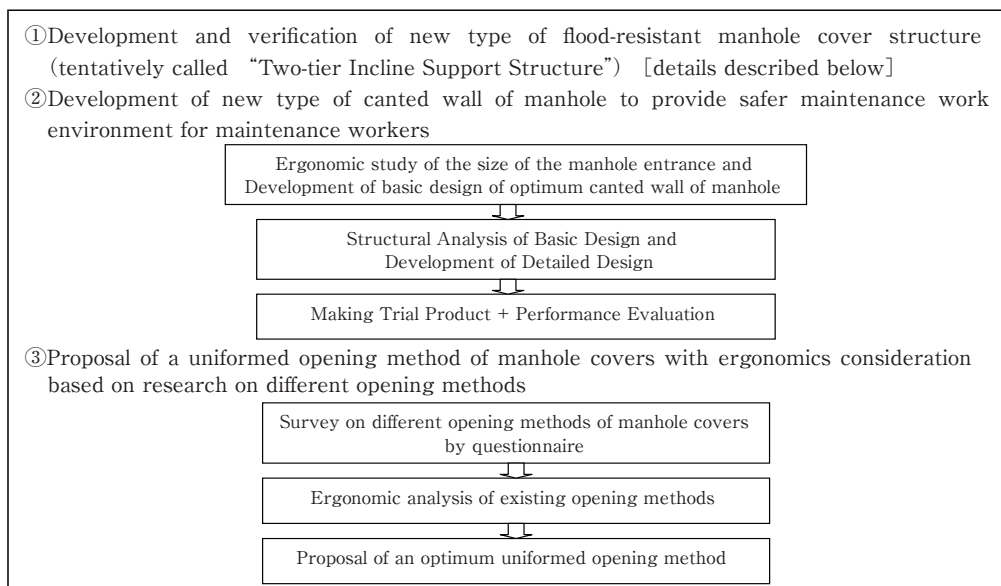
1. Fatal accidents to pedestrians falling into manholes with no manhole covers, which were flowed away by floods from sewerage systems during rainstorms.
2. Fatal accidents to sewer maintenance workers in manholes filled with toxic gas such as hydrogen sulfide.
3. Inconvenience of wide area check-up of sewerage systems after large earthquakes by gathered supporters from different regions, due to not uniformed opening methods of manhole covers.

In order to avoid these accidents and/or inconvenience, this study aims at three points below.

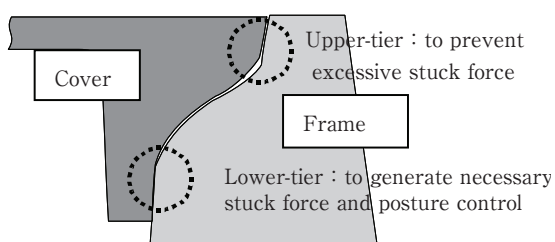
1. Development of new type of flood-resistant manhole cover structure (tentatively called "Two-tier Incline Support Structure").
2. Development of new type of canted wall of manhole to provide safer maintenance-work environment for maintenance workers.
3. Proposal of a uniformed opening method of manhole covers with ergonomics consideration based on research on different opening methods.

(Study Contents)

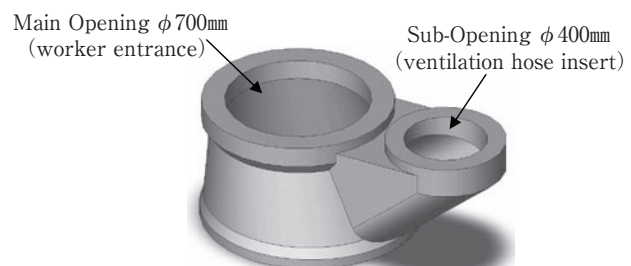
Figure— 1 shows the process of this study.



Figure— 1 Study Process



Figure— 2 Two-tier Incline Support Structure



Figure— 3 Twin-Hole Canted Wall

(Study schedule)

1. To make a trial product of tentatively called “Two-tier Incline Support Structure” manhole cover with diameter of 700mm, and to conduct loading test and verification test on performance of stuck force control are to be performed
2. To make a trial product of Twin-Hole canted wall with basic measurement shown as **Figure— 3**, and to conduct loading test and water leak test are to be performed.
3. To conduct ergonomic tests on different opening methods of manhole covers and to develop an optimum uniformed opening method to be proposed are to be performed.

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key words

Manhole covers, Prevention of scattering, A canted wall of Manhole, Opening method, Ergonomic tests