

Research on measures for the rapid water increase on storm events in a separate sewer system

Whole term

2001.4 - 2003.3

(Purpose)

The rapid increasing of wastewater quantity, which causes the rapid increasing of inflow sewage for a comparatively short time on storm events, has occurred frequently. This phenomenon is realized as the maintenance of the sewage pipe progressed. Various problems occur when the amount of inflow sewage on storm events exceeds the margin of the capability of the present sewerage facilities. To correspond this problem, in this research the plan of measure the rapid wastewater quantity increasing during storm events is positioned as the urgent risk management plan on the measure wastewater. The purpose of this research is to summarize arrangement of issues and decision of measures.

(Result)

1. Positioning of Plan for Countermeasure of Rapid Increase on Storm Events

The project aimed to consider the rapid increasing of inflow of separate sewer system on storm events as the phenomenon which cannot be quantitatively analyzed at the time of decision of sewer plan. The project decided to position the plan of measure for the rapid wastewater quantity increasing during storm events as the risk management plan which compensated the sewer plan in terms of "Safety of public hygiene", "Damage prevention of sewerage facilities", and "Water quality conservation of public water body".

2. Basic Idea of Countermeasure of Rapid Increase on Storm Events

The basic policy of decision of Plan for Countermeasure of Rapid Increase during Storm Events is shown below.

- Countermeasure of rapid increase during storm events will be decided when it is recognized necessary as the measure of risk management

- The object of measure will be present sewerage coverage area and sewerage facility.

- The facility will be positioned clearly in the sewerage overall plan with consideration of status at the end period of sewerage maintenance

- The plan will be reviewed gradually if needed.

3. Arrangement of Basic Condition

The report collected and reviewed literatures and data in order to analyze the correlativity of rainfall rate and the amount

of water inflow during storm events for planning of countermeasure of rapid increase on storm events

4. Planning of Countermeasure of Rapid Increase on Storm Events

The countermeasure of rapid increase during storm events is composed of "permeation water reduction measures" and "facilities measure" (which is combined "operation management measure" and "function improvement measure"). It was considered that "permeation water reduction measure" is continuing forward nowadays. When it is not expectable, the basic measure becomes "facilities measure", that is method to select "operation management measure" which uses the maximum of the present facilities capability as a primary measure prior measure, using "Function improvement measure" which causes the shortage of facilities capability as a reserve measure. When the combination of measure methods is discussed, not only influence in the upstream and downstream of an examination point but also influence on the whole sewerage will be taken into consideration. The measure method shall be evaluated comprehensively as the whole sewerage in terms of economic efficiency, difficulty of construction, operation and maintenance, confidence, appearance time of effects, etc. The decision flow of countermeasure of rapid increase during storm events is shown in figure-1.

5. Points of Concern on Employment

(1) It is necessary to carry out "permeation water reduction measures" as planned in the countermeasure of rapid increase during storm events. To maintain facilities of the whole conduit line

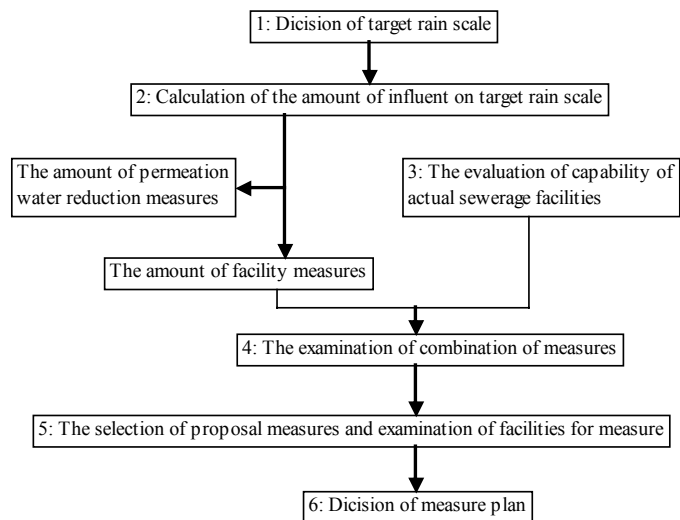


fig-1 Decision flow of countermeasure of rapid increase on storm events

including drainage facilities appropriately, it is important to carry out regular check and daily observation in order to analyze the condition of drainage facilities in residences etc. and it is important to enhance instruction of drainage maintenance to citizens and companies of construction.

(2) It is important to study the method of operation and management which sewage treatment facilities, such as conduit lines, pump places, and treatment plants work efficiently as one system, and to prepare the operation management organization for the rain storm.

6. Summary

In order to correspond to the problem of rapid increase during storm events happened in many cities, the author positioned the plan of countermeasure of rapid increase on storm events as the urgent risk management plans on the measure for wastewater, and we the arrangement of issues and decision of measures was summarized. Moreover, "the guide (proposal) of countermeasure of rapid increase on storm events in the separate sewer system" was formed.

Collaborators: Sapporo City, Kawasaki City, Yokohama City, Kitakyusyu City
Japan Institute of Wastewater Engineering Technology

Person in charge of study: Tsuneto Takaso, Eichi Okubo, Takuro Kodama, Hideki Moue, Tsuyoshi Inoue

Key words

Separate sewer system, Rapid increase on storm events, Inflow sewage on storm events, Permeation water on storm events, Permeation water reduction