

Basic study on the establishment of improvement plan for combined sewer

Whole term

1998.12~2000.3

(Purpose)

The current situation of combined sewer in Japan has not been known very well, although combined sewer need improvements. Concrete reduction rate of discharge load has not been shown, although the goal has been “separate system level”.

In this study, subjects related to of combined sewer are listed up and the goal to archive in combined sewer improvement combined sewer are proposed. In addition, analysis methods for improvement effects are proposed and improvement plan is examined for combined sewer.

The effect of separate system, analyzed by simulations, in three model areas was examined, and then proposed measures (increase of interception rate, storm water reservoir) were examined.

(Research contents)

1. Same reduction rate as separation system

The reduction rate of separate system was indicated as follows after examination of simulations in three areas:

- ① The reduction rate of total discharge load to BOD load by year was 80~90%
- ② The reduction rate of total discharge load to BOD load in storm event was 55~75%

2. Examination of increase of interception amount

- ① The reduction rate of BOD in storm event in three areas were 45~60%, when 3Q interception adapted in many cities was implemented.
- ② The improvement effects on the restraint of untreated discharge from storm outfalls, such as the loads of untreated effluent, the amount of untreated discharge, was obtained as the amount interception was increased in order to accomplish the same level as separate system. However, it was difficult to archive the same level as separate system only by increasing the amount of interception because the reduction rate of load was not observed due to the increase of the amount of primary treatment.

3. The examination of storm water reservoir

- ① A storm water reservoir in the case that 3Q interception amount was increased and a constructed storage tank was examined in order to accomplish the same level as separate system. The effects of load reduction in a year and storm event of type-III were higher than these of type-II after comparing types of storm water reservoir by simulation.
- ② The effects of reduction in the number of untreated water discharge events was higher in type-II.
- ③ After simulations in three areas, it was possible to accomplish the same level as separate system by 3Q interception and storage capacity of 3 mm in type-III, but it is impossible to do even by storage capacity of 10 mm in some areas in type-II.

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Key words

Improvement of combined sewer, Gradual improvement objective,
Same as separate sewer system