

Survey study on efficiency improvement of rain water measures in regional public corporation

Whole term

1999.11 - 2001.3

(Purpose)

In recent years, projects for rainwater storage and infiltration are considered as an important measure not only for the effect of outflow control of rain water, but also the environmental effect such as a ground water recharge and other effects such as water utilization and amenity.

This research intends to propose a model case for the application of the rainwater storage and infiltration facilities to the community development project. The author investigated the feasibility of storage and infiltration facilities in an estate development project of a regional sector.

In this research, the author compared the project for Rainwater Storage and Infiltration with the conventional systems from the point of outflow control effect and profitability of the project in the case study. Furthermore, the secondary effects such as the environmental improvement effect were discussed by cases survey. The purpose of this analysis is to propose the efficiency technique of the measure for rain water in the project of a regional corporation through these examinations.

(Result)

1. Case Study

(1) The outflow control effect

- Case study on the site A, which had complex land utilization and various division was done. The author analyzed with changing the permeability coefficient of the site and the rate of the osmosis in appropriate place.

- Installation of the infiltration facilities was effective for the reduction of require capacity of equalizing tanks and the on-site storage was effective for the size reduction of conduits.

- Most of the inappropriate grounds for infiltration had the banking which was the main reason of low infiltration effect in those areas. Thus, the author simulated the case which appropriate places for infiltration were performed by the concern of construction of banking, and discussed for improvement of the filtration effect.

(2) Evaluation of profitability of the project

- To install the storage and infiltration facilities, the cost of construction was increased 4 - 9% in comparison with the conventional measure for rain water. However, the secondary effects such as an effect of an environmental side should be evaluated. (Since the outflow control facilities in a current project was an equalizing tank made with an open-cut method, the reason of cost increase was that the cost reduction effect when reducing equalizing-tank capacity was small.)

- If there is a plan of outflow control facility such as a large-scale storage pipe, to upgrade the measure for rain water in an established city, then it can be considered that scale of the plan of outflow control facility are reduced by introducing storage and filtration facilities and cost becomes relatively small.

2. Cases Survey

(1) The secondary effects such as environmental effects.

The secondary effects (flux recovery of the river, ecosystem preservation, creating of waterfront, etc.) were analyzed by introducing storage and filtration facilities though the case study.

(2) Operation and maintenance

The case study was conducted separately in each area (residential area, public utilization area, corporate area) of facilities. The structure of organization of operation and maintenance and the security method of its implementation was discussed.

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Key words

Rain water measures, Stormwater storage facilities, Stormwater infiltration facilities,
Aquatic environment