

## Survey study on rain water drain plan of Chiba City center processing district

**Whole term**

**1998.10-2000.1**

### (Purpose)

Combined sewer system has already developed in about 337 hectares of city around downstream along Miyako and Yoshi River in central treatment area in Chiba city. In this area, increasing the amount of rain outflows is caused by urbanization of upstream site, and flood damage occurs frequently. Moreover, the water pollution by overflow at the time of initial rain is concerned.

Then, the formulation of redevelopment plan of sewer aiming at measures to flood and improvement of combined sewer has been advanced from the Heisei 9 fiscal year. However, reexamination of this project was needed, since the scale of pump place becomes 49 m<sup>3</sup>/s by adopting flow type peak response method, and huge expense and construction period are needed in initial plan. After that, the system combined storage and discharge was added to examination in order to reduce the scale of pump place from cost reduction point of view.

In this research, the examination on expected influence was conducted, when the storage system, routes and areas which are adjacent to areas planned at first are added for reducing cost and early effect of project, in 1998 fiscal year. Some examinations such as the influence on important structures, the route based on examination results, the outline of catchment systems and the reduction effects of pollution load by the improvement of combined sewer were conducted in 1999 fiscal year.

### (Results)

#### (1) Examinations of the influence on important structures and route

Examinations of influences on river structures, Chiba Urban Monorail, bundle shields, common dusts and JR by constructing main lines of rainwater were conducted. As the result, it was proposed that examination of working expenses and time was estimated conducted on foundation piles and soil protection in Chiba Urban Monorail which the high influence by neighboring construction. It proposed that road route along Yoshi River should be changed to that of road route to avoid adjoining area on the monorail in the first phase of the project.

#### (2) Examination on the catchment system

Since it is necessary to enlarge the depth and the diameter of storage pipes becomes large, the structure taken into storage pipe becomes complicated. The author proposed that the outline of catchment system, including catchment position and high drop method which collects conduit pipes from existing storm outfall room, since it is necessary to minimize the number of parts which takes in rainwater.

#### (3) Examination of improvement of combined sewer

Reduction effect was examined based on the amount of rainwater flow calculated by using modified RRL method and also pollution load was calculated.

#### (4) Examination of storage capacity

Based on results of rainfall analysis, the safety of storage facility capacity for design rainfall was checked and drainage time and pump capacity was set up.

#### (5) Examination of an outline construction method

The outline method considered into the conditions of soil property and construction, reliability, economic efficiency, and other topics on the construction method of main route, shaft and storm water reservoir. In this result, reverse circulation type or mud pressurized shield method were selected for the main route, pneumatic caisson method against shaft method and cast-in-site diaphragm wall for storm water reservoir.

#### (6) Examination of the early project effect discovery

We plan to place in service tentatively in order to get faster effects by constructing shaft in Miyakogawa park and storage pipe in upstream as the first project. The outline of pump facility capacity in tentative period, place to set up, and drainage place from the viewpoint of improvement of combined sewer was examined.

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Key words

Deep underground, Large caliber, Storage pipe, Flood measures, Combined improvement