

## **8-2 Tokyo Effective Drainage Plan Including Stormwater Reservoir and Connecting Pipe**

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### **1. Background**

Regional sewerage bureau of Tokyo Metropolitan Government carries out the construction and management of regional storm sewers as well as regional sewerage system of two or more municipalities concerned. The construction of storm sewers requires long period and vast investment, and sometimes faces difficulties because of shortage of flow capacity of receiving water body and insufficient workspace.

### **2. Outline**

In order to overcome the above difficulties, drainage plan has to be prepared flexible taking into consideration on construction easiness and effectiveness.

A case study was carried out in which the existing drainage plans of two river basins were revised and an economical and effective drainage new plan is prepared on the above concept.

The study area is neighboring two basins; approximately 900ha of Kurome and Ochiai River located in northern part of Tokyo. Regional storm sewers were planed at Kurome and Ochiai River basins respectively. Kurome regional storm sewer was already constructed. However, Ochiai storm sewer faces difficulties of shortage of flow capacity of receiving water body, Ochiai River, and insufficient workspace. In order to conduct flood mitigation project at Ochiai River basin immediately, drainage plans of the two river basins were revised and more practical plan including staged construction program was prepared.

Since outfall structure of Ochiai storm sewer was supposed to be not constructed in early stage, a connecting pipes for two basins and a regulating reservoir were included in the new plan. Unsteady flow analysis was introduced to evaluate an effect of each construction stage and to revise drainage diameter for economical facilities distribution.

### **3. Results**

As the results, staged program in which drainage capacities of the area could be gradually improved from rainfall depth of 20mm/hr to 40mm/hr and to 50mm/hr can be prepared and construction work can be started immediately. Moreover, construction cost can be reduced because of revised smaller diameter of storm sewer estimated by unsteady flow analysis.

It is confirmed that even reduced diameter can cope with 50mm/hr of rainfall depth in standard design criteria at final stage of construction when the outfall of Ochiai River is constructed. The connecting pipe is also useful for exceeding rainfall occurred at either basin in the future.

Keywords: Storm Sewer, Reservoir, Receiving Water Bodies, Unsteady Flow Analysis