

## Study on the building-pit drainage technology

Whole term

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### (Purpose)

The underground parts of the architectural structures are generally constructed below sewers, and thus the wastewater needs to be stored in a building pit until it drains to the sewer. The longer stay of wastewater in the pit causes decomposition. Therefore, the foul odor generated from the pit when draining to the sewer becomes a target of public complaint. The problems related to the building pit including this foul odor are called “ building-pit problems.”

Thus, this research aimed at standardizing a method to improve the drainage technique and publishing a design manual on the reconstruction of the facility.

### (Improved method)

- ① As a method to improve this technique, the anaerobic-state should be prevented by the aeration and stirring in the pit and the reduction of the retention time by immediate drainage, and a variety of apparatuses and design methods are also suggested for the aeration and the stirrer.
- ② A specific design method or pieces of equipment for the reduction of retention time have not yet been developed in spite of its simple principle and the fact that subject of this research is immediate-drainage building-pit system.

### (Contents)

- ① Investigation on the prevailing condition of the existing building pit (in 2000)
- ② Verification of experiments for the examination of resources (in 2001)
- ③ Publication of a technical manual (in 2001)

### (Results)

- ① Experiments for verification
  - The underwater pump was installed in a small-sized barrel of synthetic resins constructed in the existing building pit so that the inflow of wastewater could drain immediately.
  - Both the odor index and hydrogen sulfide concentration decreased 1 month after the experiment was started and the immediate-drainage effect was confirmed.
- ② Technical manual
  - The main object was the existing building pit system with a relatively less design wastewater discharge that was less than 50 m<sup>3</sup>/h.
  - The underwater pumps are of Ø 50 mm and Ø 60 mm and the installation of 2 pumps (one as a spare one) are selected as the standard.
  - The operation of one pump is the standard, however parallel operation by turns can be considered for the case of the wastewater discharge over the design inflow.
  - The barrel is a column of synthetic resins with Ø 500 mm and Ø 800 mm that can be inserted in manholes of Ø 600 mm and Ø 900 mm.
  - The combination of the pump and the barrel is determined in consideration with the shape and the size of the existing building pit, the discharge and fluctuation of wastewater inflow, the safety of the facility and the economic analysis.

Collaborators: Japan Institute of Wastewater Engineering Technology

Awamura Manufacturing Co., Ltd., Ebara Corp., Kubota Corp., ShinMaywa Industries, Ltd., Pacific Machinery & Engineering Co., Ltd., Tsurumi Manufacturing Co., Ltd.

Personnel in charge of the study: Tsuneto Takaso, Yuichi Ichikawa, Takahiro Ito, Takeshi Shiota

Keywords

Building pit, Anti-corrosion, Hydrogen sulfide