

Fundamental research on the measure of a separate sewer system in case of storm events

Whole term

1999.1-2000.3

(Purpose)

In Flow of groundwater, rainwater and others do not only cause adverse effects to functions in treatment facilities, but also increase the cost. If the amount of inflows exceeds the limit of a treatment plant by temporary permeation of rainwater, serious problems may occur.

This research, analyzed the characteristics and influence of unknown water, (the amount subtracting uncharged water from the influent) for a sewage treatment plant that had comparatively small throughput in 1998 fiscal year. Based on this result, the survey place was selected further in consideration of the generating factor of unknown water, and derived detailed data from the investigation and the field survey in 1999 fiscal year. Furthermore, the author examined the measure of the separate sewer system in case of storm events into the consideration of the local characteristic based on this issue.

(Investigation and examination situation)

1. In 1998 fiscal year, the survey on unknown water was performed concerning of the sewage treatment plant in 242 communities which treat 1,000 m³/day - 15,000 m³/day of wastewater on average of fine weather and analyzed the following matter.
 - ① There were 32 treatment plants which generated the 25% or more of the unknown water to the amount of wastewater on average of fine weather.
 - ② A certain obstacle had occurred to the treatment plant or the conduit facilities at 17 plants as the result of questionnaire to those 32 treatment plants.
2. In 1999 fiscal year, the investigation and the field survey to 12 in the part of plants which a certain obstacle had occurred were performed. As the result, the data at the time of obstacle occurring, etc. could be obtained from 11 places, and the following point can be analyzed.
 - ① The characteristics of the inflow of the amount of unknown waters on fine weather from the amount of revenue waters, the amount of inflows on fine weather, and the inflow pattern were analyzed.
 - ② The relation between the rainfall rate which had the possibility of occurrence of an obstacle and the amount of inflows were analyzed.
 - ③ The situation of the water permeation by the rainfall pattern which had the possibility of occurrence of an obstacle was analyzed.
 - ④ The trial calculation of the effluent quality from the unknown water on the obstacle occurring and treatment capability, and clarified the limitation of quality.
 - ⑤ 12 plants which were investigated in 1999 fiscal year were classified in terms of the possible rate of primary treatment which can be derived from the rate of unknown water on fine weather, the permeation rate of rainwater, the margin of treatment capability, and the quality of effluent. Furthermore, the project proposed the state-of-art of measures on storm events, based on the classification.

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Key words

Separate system, Unknown water, Small-scale sewage treatment plant survey