

## Survey study for the influence on the sewerage facilities by introduction of disposers

Whole term

1999.4 - 2001.3

### (Purpose)

The argument on introduction of the disposer has been activating from a time that "disposer effluent treatment system" has received the Minister of Construction's authorization as the plumbing system based on regulation of a The Building Standards Law (abolished now). Apartment houses with disposer introduction in drainage treatment system started to be built in urban areas. It becomes important to understand the influence of disposers directly connected to sewage treatment facilities. It is becoming important to examine influence not only on sewerage facilities but also on solid wastes treatment.

We assumed that the directly connected disposer was installed in sewerage coverage area, and researched the degree of influence on wastewater treatment system and solid wastes treatment system especially on solid mass balance, the economic efficiency, etc. Specifically we collected and arranged the fundamental data of disposer and past literatures, and carried out the case study of model of city.

And we arranged the standard way of examination at the time of utilizing technique of the calculation of this research in other local governments etc.

### (Result)

#### (1) Collection and arrangement of the past surveys and data on disposers

We collected and arranged literatures of the past survey and data about overview, spread and practical cases of disposers and influence on the sewerage and solid wastes treatment system.

#### (2) Case study in the model of city (area)

① We selected the central Fukuoka treatment area and the western Fukuoka treatment area as the model of city (area), and we decided to analyze the case that the directly connected disposer was installed in these areas based on the actual data in 1997 fiscal year. In practice, since the sewerage area and the solid wastes collection area were different, we assumed imaginary solid wastes collection area shaped to the sewerage area and collected facilities capability etc.

② When directly connected disposer was installed in 100% of the area, about 30% of the volume of solid wastes reduced. As for the solid mass balance of the sewerage facilities in the whole area of the central and western treatment area, about 68% of the accumulated sludge in the conduit, about 28% of the sediment and sludge in the pump, about 53% of the sludge production, about 38% of the volume of the dehydrated cake, and about 45% of the volume of the incineration were increased in this case. The result was obviously different in the central area and western area. It could be considered that the difference of the amount of industrial garbage, inflow load of SS, etc. caused the difference of result.

③ When directly connected disposer was installed in 100% of the area, it was calculated that 17% of the capacity of collection and conveyance (10.5% of the cost of them), about 10% of the volume of the incineration (6% of the cost of it), and 13% of the volume of waste as landfill (1% of the cost of it) were reduced in the solid wastes treatment system.

④ When directly connected disposer is installed in 100% of the area and the present condition of sewerage system was maintained by increase of frequency of cleaning, which followed to increase of the accumulated sludge of the conduit by increase of the amount of inflow SS, 30% of present cleaning cost (at the central treatment area) and 90% of present cleaning cost (at the western area) were increased. The maintenance cost of the conduit increased about 20 - 50% by the cleaning cost. In the sewerage treatment facility, increase of facilities for sludge treatment system was needed with increase of inflow load, so the maintenance and operation cost of them increased 3 - 7%.

⑤ We discussed the influence on combined sewer by introduction of directly connected disposer using existent model of the improvement of combined sewer of Fukuoka city. When we used COD as the indicator of load reduction like the existent model and changed the basic values such as the fine weather pollution load, the total outflow load became from 1.14 to 1.26 times higher than the case without disposer (the existent examination result of improvement of combined sewer examination result).

⑥ We arranged the simulation method which was used for the case where directly connected disposer spread. We put together the way of adjustment and the careful point not only about the method used in this research but also about another examination method or item, and made the reference in the case of carrying out the case study in other cities etc.

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Key words

Disposer, Simulation, Confluence improvement