

A collaborative research of effective usage of sewage sludge
in Sendai city (No.2)

Whole term

1998.1 ~ 1998.9

(Purpose)

Sendai city is planning to improve a sludge treatment center, which was partly built in August 1996 for centralized sludge treatment. The quantity of sewage sludge in Sendai city is estimated to increase as sewerage system is distributed and the advanced sewage treatment facilities are introduced. On the other hand, effective usage of sewage sludge is one of the most important countermeasures of sewerage system, because the capacity remaining in present disposal sites is decreasing and it is difficult to find new disposal sites. Therefore, utilization of lime-including incinerator ash for soil stabilization additive has been considered since 1996 as an economical and efficient countermeasure, which is suitable for the particular regional characteristics, in order to develop a stable recycling system of sewage sludge. Coagulant type shifts from lime to polymer in the dewatering system in Sendai in this year. Therefore, adaptation of incinerator ash from polymer coagulant as soil-improvement material is considered and its marketability and distributional aspect were considered through investigation of excess soil generated with construction works in the city.

(Results)

* The condition where incinerator ash from polymer coagulant is to be utilized as soil stabilization additive

When sand gravel mixed with fine-grained soil is used for soil stabilization in order to secure soil structure and to secure profitability of the plant producing soil stabilization additive, then the ratio between the incinerator ash from polymer coagulant and the soil for stabilization should be 1:4; adding 40kg of quicklime into 1m³ of mixed soil.

* Effect of each material for soil stabilization

The incinerator ash from polymer coagulant gives low ratio of water content in the stabilized soil. Quicklime gives better structure to stabilized soil.

* Caution in using the incinerator ash for soil stabilization additive

The conditions above may be changed by the soil which is to be stabilized. Thus, the ratio between the quantity of incinerator ash from polymer coagulant and the quantity of soil for stabilization, and also the quantity of added quicklime should be adjusted for each target soil for stabilization.

* The quantity of excess soil generated with construction works, which requires soil stabilization in relation to sewage construction by open excavation, is 67,200m³/year in this city. The demand of improved soil is about 49,100m³/year.

* According to the general economical investigation of such plants producing soil stabilization additive, it seems that such plants will be profitable, assuming that the demand of stabilized soil is about 49,100m³/year as above.

*It is possible to utilize all amount of incinerator ash as soil stabilization additive. The decision needs to be taken from the viewpoint of recycling of incinerator ash and the capacity of disposal sites.

(Future challenges)

* Environmental aspect

As exploitation of soil for backfilling and disposal of excess construction soil result in additional environmental load, it is necessary to seek ways to reuse construction soil

*Marketability

As the demand of stabilized soil in sewerage system is limited in quantity, it is ' s necessary to seek ways to work with other business enterprises.

***Collaboration with other business enterprises**

A negotiation with Road Department is necessary when we use stabilized soil for backfilling. Therefore, we have to think about the collaboration with other business enterprises as it is necessary for such recycling business to assure marketability and distribution.

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Keywords

Sludge, incinerator ash, effective usage, soil stabilization