

Study on improvement of combined sewer system (by adapting infiltration system)

Whole term

2005.10 ~ 2006.3

(Purpose)

Fukuoka city had decided to working on of separate sewer systematization, in order to improve combined sewer system's problem, so that the separate sewer systematization project has been progressing by burying drainage pipes and installing infiltrative gutter in 300 hr area around Hakata station, since 2004 fiscal year.

Even though effects such as mitigation of flood risk, reduction of pollutant load and fostering groundwater are expected from infiltrative facilities, investigation into influence of infiltrated water on road structures and groundwater through field survey are needed.

The purpose of this study is to propose the investigation plan which is to inspect the effects of adopted infiltrative facilities by gathering and arranging basic information from Fukuoka city's geology maps and groundwater maps, as well as to reveal influences of infiltrated water on neighboring environment (such as road structures and groundwater) by reference search and questionnaire on local governments.

(Result)

1. Influences of infiltrated water on neighbor environment

As well as carrying out the reference and example search for the influences of infiltrated water on neighbor environment (such as road structures and groundwater), questionnaire on 28 local governments adopting infiltrative facilities, which are identified by the example search, has done. The results are as follows.

(1) Influences of infiltrated water on road structures

Detailed continuous investigation into influences of infiltrated water on road structures by local governments that had considered adoption of those facilities as a measure to counter urban flood for many years have done. As a result of this investigation, examples of measurements for three years about road surface displacement distant and roadbed displacement distant with and without those facilities have found. And no effects on road structures have been identified. Considering rainfall in Fukuoka City and geology of this region, this result can be applicable to the designed area.

(2) Influence of infiltrated water on ground water

As to influence of infiltrated water on ground water, an example that has observed ground water quality (water quality standard items for drinking water : nitrate nitrogen, E.coli. etc.) for twenty years was found. Although some water quality items that exceeded standard value were found, a significant difference between ground water upstream and downstream of infiltrative facilities was not found, and it had been confirmed that infiltrated water would not influence on ground water quality. It was supposed that because contaminants that infiltrated the facilities were removed physically or biochemically, expectation of same effect could be confirmed in Fukuoka City, and there were no possibilities that infiltrated water might influence on ground water quality.

2. About future investigation plan

A five-year plan is made to carry out field investigation based on Fukuoka city's geology maps, groundwater level maps and Design maps of installing infiltrative gutter in area around Hakata station, to choose six candidacy of infiltrate test sights and verify infiltrative capacity.

3. Summary

In this study, by reference/example search and questionnaire on local governments, it had been confirmed that infiltrated water would not influence on ground water quality. And a five-year plan is made to verify infiltrative facilities effectiveness.

The facilities effectiveness will be verified through field infiltration test that is based on the investigation plan of this city.

Research commissioned by Fukuoka City.

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key words

Improvement of combined sewer system, Infiltrative gutter, Influences on neighboring environment