

Joint Study on Efficient Installation Techniques for Elimination of Unsewered Areas in Uki City

Year of Research

2007

(Purpose)

Uki City's public sewer service received approval for the present Matsubase-Shiranui treatment area in 1980. Since then, the city has devoted itself to promoting the service so as to prevent water pollution in public water areas, improve the living environment, and the like.

However, percentage of sewerage population in Uki City is only 38.0% as of the end of fiscal year 2006, which is lower than the national average of 70.5% and the figure of 56.6% for Kumamoto Prefecture. With the administrative district being expanded by a merger in January 2005 and the financial circumstances having been severe, the lifestyle and life pattern of residents have changed, and there is now demand for a more comfortable civic life and for water quality conservation in public water areas. Thus, to facilitate sewage treatment facility construction, it is essential effective installation techniques be introduced.

The Ministry of Land, Infrastructure, Transport and Tourism started the pilot Project for the Quick Elimination of Sewer Unavailability in fiscal year 2006. This scheme is intended to effectively eliminate unsewered areas. This study thus aims to investigate the introduction of techniques that facilitate flexible construction and cost reduction and create a pilot project plan.

(Results)

(1) Problems associated with sewer unavailability

Because the district for the research is mountain village, the following problems exist with regard to sewer installation.

- There are many winding, narrow roads with steep slopes in places, so the pipe construction is difficult.
- The roads in the village will have a heavy impact on residential life if traffic regulations or the like for construction zones are enforced.

(2) Investigation into introduction of techniques for the elimination of sewer unavailability

As an object of the pilot project, the techniques in the following table can be introduced. In the Nagasaki area, about 2,000 meters was selected out of about 5,200 meters as the total pipe length. In the Minami Ogawa area, about 2,200 meters was selected out of about 4,500 meters.

Table 1. Results of investigation into introduction of unavailability elimination techniques

Type	Unavailability elimination technology	Situation in this district	Feasibility of introduction
Sewer installation techniques that require piloting for new technology introduction	Exposed piping for pipe culverts	Few houses face the watercourse. Many watercourse crossings have already been constructed.	Almost unfeasible
	Continual adoption of improved inverted siphon	There are few underground installations. The ground surface is not flat.	Unfeasible
	Variable slope sewer construction using bent pipes	There are many routes of steep gradient.	Feasible
	Reuse of dug soil as pipe foundation	Gravel is mixed in the soil.	Unfeasible
	Use of liquefied stabilized soil as backfilling material	No roads are so narrow that construction is difficult.	Unfeasible
	Factory-made, extremely small-scale treatment facilities (membrane separation type (PMBR), contact aeration type, and membrane separation type)	A treatment plant is already installed.	Unfeasible
Installation techniques that ready for widespread use	Application of gradual slope for house connection pipes	There are few places where low residential land has an effect on the main pipe bottom height.	Unfeasible
	Permission of design maximum flow velocity more than 3.0m/s	There are many steep routes.	Feasible
	Use of improved inverted siphons	There are few underground installations. The ground surface is not flat.	Unfeasible
	Use of stabilized soil for pipe foundation	Gravel is mixed in the soil.	Unfeasible
	Reduction of manholes by using bent pipes etc.	There are many curved roads.	Feasible
	Extension of manhole intervals	The road has long straight sections in places.	Feasible
	Extension of pipe jacking spans of small diameter pipe jacking methods	There is no pipe-jacked route.	Unfeasible
	Expansion of application condition of manhole type pumping stations	Manhole pumps are already installed.	Unfeasible

(3) Creation of pilot project plan

A pilot project plan as described like the above-mentioned was made.

(Conclusions)

This study revealed unavailability elimination techniques that can be introduced in the Nagasaki and Minami Ogawa areas, and an application for adoption of the project was successfully submitted.

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Key words

Sewer pilot project, Project for the Quick Elimination of Sewer Unavailability, area revitalization