Study on the Quick Project for Prompt Sewerage Development in Okazaki City

Year of Research	2008・2009	

(Purpose)

The Ministry of Land, Infrastructure and Transport started the Quick Project for Prompt Sewerage Development in FY2006. In the Quick Project, the social experiments have been implemented introducing innovative methods that enable cost and time savings in sewer construction based on local characteristics.

This study was conducted to evaluate performance and effectiveness of "Variable slope sewer construction using bent pipes" adopted in Okazaki City.

(Result)

Result of evaluation is shown below:

- -Construction cost was reduced by 17%.
- -Actual flow velocity was 3.0m/s or less, and no adverse impact to pipe was observed. Wastewater flow was generally smooth.
- - No sedimentation was observed in bent pipes and inclination change points.
- -Construction period was reduced by 19%.
- -There was no problem in using general maintenance equipment, such as CCTV (closed circuit television) and high-velocity cleaner.
- -Maximum locating error of pipe position by electronic markers laid underground was only 8cm, therefore accuracy was practically sufficient.
- -Observed values of odor, noise and hydrogen sulfide was below the regulation standards (evaluation values), therefore no adverse impact to surroundings is considered.

Table-1 Result of evaluation

Evaluation item	Conventional method	New method	Result	Remarks
①Construction cost	58 million yen (58,000 yen/m)	48 million yen (48,000 yen/m)	17% reduction	994m（φ200） Cost estimation including overheads
②Effect on operation and maintenance cost	—	—	—	Planned to be evaluated in FY2009
③Sewage flow	—	-Actual flow velocity less than 3.0m/s -Sewage scattering observed in some sewers	-No adverse impact on pipe by flow velocity -Sewage scattering under observation	
④Sedimentation of solid	—	-No sedimentation due to use of bent pipes observed -No problem due to solid flow in steep slope sewers	No problem	
⑤Construction period	100 days	81 days	19% reduction	994m（φ200）
⑥Workability of maintenance equipment	—	General maintenance equipment workable	No problem	
⑦Applicability of locating markers to manhole omission points	—	Maximum locating error of pipe position by electronic markers: 8cm	No problem	Operation skill required
⑧Impact to surroundings	—	Odor -Above the ground Odor index: less than 10 -In manhole Odor index: less than 30 Hydrogen sulfide : maximum 4.4ppm Noise : 47-54dB	Under the regulation standards	Regulation -Odor index (Above ground) : 12 -Hydrogen sulfide : 10ppm -Noise : 55dB

(Summary)

As a result of evaluation, construction cost reduction of 17% and construction period reduction of 19% were confirmed. Regarding other evaluation items, it was considered that there was no problem, although sewage scattering was observed in some sewers.

In FY 2009, the evaluation will be continued with regard to effect on operation and maintenance cost, sewage flow, sedimentation of solid, and adverse impact to surroundings.

Research funded by Okazaki City

Contact: Hiroaki Morita, Yoshihiro Morishima, Yoshihiro Tanaka

Key words	Prompt Sewerage Development, Variable slope sewer construction using bent pipes, Social experiment, Evaluation, Construction cost reduction, Construction period reduction