

**Investigation research on evaluation of performance of vertical pipe in Chikuma River river-basin
sewerage upstream treatment district Nagano Prefecture**

Period

109P ~ 112P

1999.10 ~ 2000.3

(Purpose)

With the aim of improvement on structure and maintenance of the manhole with the high head, It has been promoted that technology development and establishment of design method "the spiral guideway style drop shaft" which makes whole quantity of sewage vertically fall down by foundation cooperated with Nagano Prefecture since 1994.

On the last manhole (in disposal facility) of treatment district in Chikuma River trunk line of Chikuma River river-basin sewerage upstream in Nagano Prefecture, it was installed as first unit of the drop shaft based on this research result, since there is about 12m of head high with flowing to relational public sewerage.

The object of this study, the drop shaft which began to be used in September, 1996, had been investigated the change of materials, sedimentation situations and installation situation with the purpose of confirming the validity of design items for over 3 years .

(Result)

The diameter of drop shaft investigated is 350mm, the largest drainage discharge in plan time is 0.052m³/s and the discharge as design object was expected as 0.026m³/s with allowances rate 100%.

1. Investigation items of performance evaluation

- 1) Measurement of the installation dimension, installation situation and inner surface of pipe, identification of appearance.
- 2) Confirmation of all displacement volume of the drop shaft.
- 3) Confirmation of odor and noise in the manhole.
- 4) Investigation of downward flow situation and contaminant of sewage.
- 5) Measurement of wall thickness of drop shaft member (measurement of the wall thickness depletion quantity and observation of surface state by electron microscope).
- 6) Investigation of water quality and discharge.
- 7) The strength inspection (measurement of crushing strength of FRPM pipe piece, measurement of bending strength of FRP guide plate, evaluation of the water proof rubber, evaluation of guide plate stationary portion).

2. Examination of measurement results

- 1) On situation of the installation, it did not change at all in comparison with the result of the installation
- 2) On material change, it had strength capacity almost as the beginning.
- 3) On downward flow situation, according to the investigation by inserting cameras, etc., the spiral flows flowed along the pipe's wall almost as same as assumed at the beginning. And, the contaminants could not be seen as the cause of blockage.

According to the above facts, though it has been an in-service period for about 3 years, the drop shaft had not abnormality, and the function was demonstrated as design, so the design technique and validity of materials development were able to be confirmed.

(Future problem)

Since the period was short as 3 years, it is necessary to investigate and examines the stresses capacity, abrasion, and corrosion situations after the using of long time, etc. in future.

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Key Words

drop shaft