

Investigation research on another 2 perpendicular sewers of Saigawa Azumi area river-basin sewerage

Period

1998.8~ 1999.3

(Purpose)

The manhole with the high head has been nationally founded in great numbers. However, there are many problems in aspects of structure and maintenance because the design technique proven with theory and flow characters for high head has not been established.

With "sewerage facilities plan and design guideline and explanation", the applications of level difference junction or step junction using the duplicative pipe was conducted as joining method of sewers installed in the steep gradient surface. However, in fact there are many examples of the manhole with the high head founded only for drainage freely falling down without applying level difference junction or step junction for the economical reasons and so on. When such manhole was founded, the problems such as dispersion of the sewage, scour of the manhole bottom, air entrainment, noise and vibration, odor and so on occur. In order to solve these problems, the high head works such as multistage free falling style, plunging style, vortex and spiral guideway style have been devised and used in practice. In Japan institute of Wastewater Engineering Technology, the examination has been advanced for spiral guideway style drop shaft of the middle omission style since 1994.

This examination designed the drop shaft for high head manhole planned by the 3 construction office in Nagano prefecture.

(Result)

For the high head manhole, the drop shaft was designed based on research results till now. The outline of construction office and river-basin sewerage of cooperative research is shown in the following.

Chikumagawa River watershed construction office in Nagano Prefecture.

In Chikuma River trunk line of the Chikuma River river-basin sewerage in Nagano Prefecture, in order to cross the river bed by natural downward flow, the overburden is made be deep with 15 ~ 19m, and the manhole with high head over 2m has also be planned in great numbers in junction with relational public sewerage.

Kiso construction office in Nagano Prefecture (the depopulated taking over business).

The route constructed in the depopulated taking over business is a trunk line of specific environmental preservation public sewerage of Kiso District Narakawa village in Nagano Prefecture. In the joint, the manhole with high head of about 5m has been planned for this trunk line in order to pass through terrace surface in Naraigawa River.

Toyoshina construction office in Nagano Prefecture.

Saigawa Azumi area river-basin sewerage Misato primary trunk line joins the Misato second trunk line on the way in Nagano Prefecture, and it flows into the Toyoshina Azusagawa trunk line. Due to the topography some manholes with high head over 2m have been planned.

The items of drop shaft of design object are shown in the following as range.

Drop shaft number: 17 units.

Drop shaft diameter: F250-F900.

Plan inflow: $0.001\text{m}^3/\text{s}$ - $0.314\text{m}^3/\text{s}$.

Head high: 2.0m - 8.8m.

Collaborators : Chikumagawa River river-basin sewerage construction office in Nagano Prefecture

Toyoshina construction office in Nagano Prefecture.

Kiso construction office in Nagano Prefecture

Japan institute of Wastewater Engineering Technology

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Key Words

Drop shaft, high head manhole