Research on practical application of perpendicular pipe (the drop shaft)

Period	1994.10～1998.3	

(Purpose)

The research of perpendicular pipe (the drop shaft) started from 1994 for the purpose of the solution of the problems from adopting of conventional duplicative tubular structure over the application range. As "the new technology utilization model business", it was applied in Chikuma River trunk line of the Chikuma River river-basin sewerage in Nagano Prefecture, in September, 1996.

And, recently, in the city where with the rapid urbanization, the underground space became high density, and in the cities with steep topography, the case which has to consider the countermeasure for high head manhole is increasing, while the buried work depth of the sewerage trunk line tends to deepen in the sewage improvement.

From such background, the municipality which examines the adoption of perpendicular pipe (the drop shaft) is increasing.

With public organizations of client, the cooperative research was carried out, and on the base of results, it aims at the standardization and the popularization of perpendicular pipe in the near future, while the practical application is attempted for perpendicular sewer (the drop shaft).

Main groups for cooperative research are shown in the following.

○ Practical application research of perpendicular pipe (the drop shaft) (reported in fiscal sewerage new technology laboratory annual report 1995).
Chikuma River river-basin sewerage construction office
Sewerage section, civil engineering department of Nagano prefecture

○ Cooperative research on the standardization of high head falling works introduced into combined sewerage.
Tokyo Metropolitan Gov., Bureau of Sewerage.

○ Cooperative research of the high head manhole.
The Sewage Department of Construction Bureau Sewerage in Funabashi City.

○ Cooperative research of perpendicular sewer
The Sewerage Department in Otsu City.

○ Business consignment on the development of perpendicular sewer.
Fukushima Prefecture middle area sewerage construction office.

○ Development research of the tubing for perpendicular sewer (the drop shaft)
The Sekisui Chemical Industries Corp.,.. Kubota Corp.,.
Mitsubishi plastics industries Corp.,..

Still, the cooperation of Univ. of Tokyo engineering graduate course・Social foundation engineering major Tamai nobuyuki professor has been conducted for hydraulic test and analysis in this research.

(Result).

1) Items of the perpendicular sewer (the drop shaft) used practically at present.
Installation position: 7 places (Chikuma River river-basin sewerage Chikuma River trunk line in Nagano Prefecture).
Shaft diameter: F 350mm-F 900mm
object discharge : about 0.05-0.06m^3/s
head height: The about 6.0-12.0m
shaft material: FRP

2) Installation schedule in 1997 , 1998
The installation position: About 15 places (Nagano Prefecture, Koshoku and Funabashi City. Otsu City, Fukushima Prefecture).
Shaft diameter : F250mm - F1500mm
object discharge : about 0.01-1.20m3/s
head height : about 3.0-10.0m
shaft material : FRP

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Key Words	Perpendicular pipe and drain (the drop shaft), high head manhole, practical application