

Research on the development of pipe for perpendicular sewer (drop shaft)

Period

1995.2~ 1998.3

53P~ 58P

(Purpose)

The manhole with high head has been founded nationally in great numbers. However, there are many problems in structural aspect and maintenance because the design technique proven in flow characteristic and theory for high head have not been established.

With "sewerage facilities plan and design guidelines and explanation", the application of level difference junction or step junction are shown as a joining method of sewer in the case of steep gradient surface. However, there are many cases of founding the high head manhole without applying level difference junction or step junction in fact. Various head construction methods has been proposed and used practically in order to solve the problem of the high head. Within these, the examination has been advanced for spiral guideway style perpendicular sewer (the drop shaft).

In this report, the research result on the material used for the drop shaft is reported.

(Result)

As one of the performances necessary for the material of drop shaft for the purpose of space saving, it is raised to have the smoothness of the inner surface in order to smoothly flow the sewage. In this examination, reinforced plastic multiunit pipe and unplasticized polyvinyl chloride pipe were made to be the examination objects.

As having performance of the chemical resistance, the using material was made to pass chemical resistance performance test by standard (JSWAS K-1,K-2,K-6) of the corporation aggregate Japan sewerage association.

The rotating drum type abrasion test model was made, and the test was carried out in order to test abrasion resistance. As a result, the tested materials also abraded in proportion to the time. And, the concrete was the most abounding for the wear amount, and the next, it was the order of casting, reinforced plastic composite material, rigid polyvinyl chloride, urethane, polyethylene pipe for the sewerage. Even in the experiment conducted by foundation national land development technical centre, the order of reinforced concrete pipe, reinforced plastic multiunit pipe, polyvinyl chloride pipe was also showed with the similar tendency with this experiment.

In addition, the followings were shown: Design load of spiral guide plate and methods of stress calculation, installation method of the drop shaft, structure of the manhole, etc..

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Key Words

Perpendicular pipe and drain, high head, tubing for perpendicular sewer