

## Cooperative research on new sewerage piping system in correspondence to the optical fiber cable

Period

1997.11 ~ 1999.3

63P ~ 67P

( Purpose )

That the network of the sewerage pipes is effectively used seems to be able to promote the improvement of communication network of optical fiber cable with the advantage of economy. At present, there are flow pulling method and robot method of laying method of laying optical fiber cable to the sewage pipe. On the flow Pulling method, the structure should have enough weight to keep the optical fiber cable not run away by the sanitary sewage, so it is so difficult to bend and is not easy to handle in manhole. Moreover, there is a problem that laying cable takes more time by the conventional robot method.

Then, in this organize, by ensuring the space that contains the optical fiber cable in sewerage pipe in advance, the practical application of sewer corresponding to easily laying optical fiber cable (general name of correspondence sewer and correspondence manhole) has been developed since 1995. In this study that specification, field trial, applicability evaluation to actual operation of adaptable pipeline is reported.

( Result )

As a correspondence pipe line, the examinations of adaptable Hume tube, adaptable vinyl chloride tube, and adaptable manhole were carried out.

### 1. Adaptable Hume tube

The adaptable Hume tube is a shape shown in Fig.1, and the holder has been installed at the top of pipe. The holder has been installed during pipe production with intrusion adhesion for installed insert anchor.

Flow characteristic curve of adaptable Hume pipe is not almost different from the conventional circular pipe. The laying of pipe is carried out as well as the conventional Hume pipe, while the laying of the cable is done by that previous pull the cable through sewer, and fix cable with exclusive laying robot in holder.

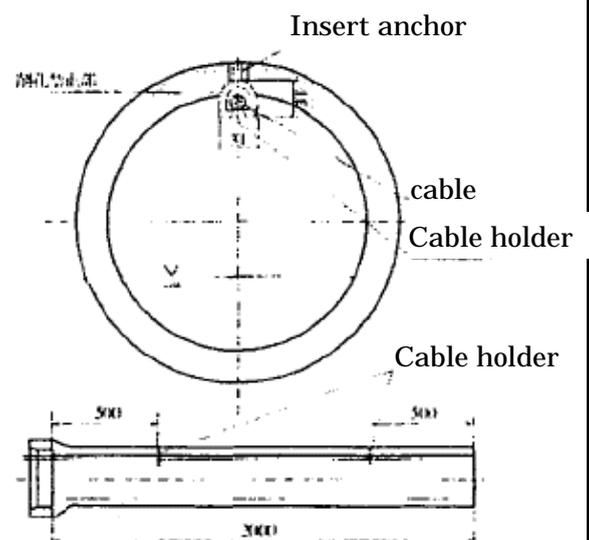


Fig.1 Adaptable Hume tube

### 2. Adaptable vinyl chloride tube

The adaptable vinyl chloride tube is shown in Fig. 2, that fixed the bracket at the sewer top, and the legume tube was inserted in the bracket. Both flow velocities, discharge decrease a little on flow characteristic curve of adaptable vinyl chloride tube in the tube upper part.

The legume tube does the adhesion in the main connection on

laying of the adaptable vinyl chloride tube as well as the conventional vinyl chloride tube using joint. The laying of cable is pulled in and towed the wire beforehand draw wire in the legume tube.

### 3. Adaptable manhole

The adaptable manhole has the function of installation junction box in the position which is an oblique wall of the assembly style manhole without hindrance to maintenance. The junction box is shown in Fig.3, because the anchor bolt has been beforehand embedded for the installation of junction box at 3 places, the installation is possible in optional position.

### 4. Field trial

The adaptable manhole was installed at the end of the ground piping with adaptable Hume tube 30m, and adaptable vinyl chloride tube 30m, and the field trial was carried out. The construction of tube was as level equivalent to traditional tube including legume tube for the optical fiber, and it was also good on the wiring of the optical fiber cable.

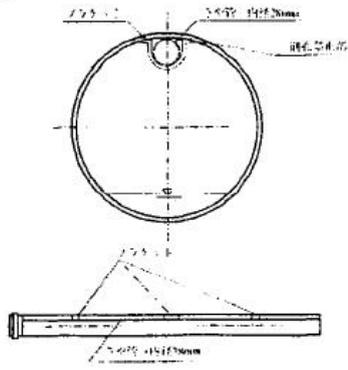


Fig.2 Adaptable vinyl chloride tube

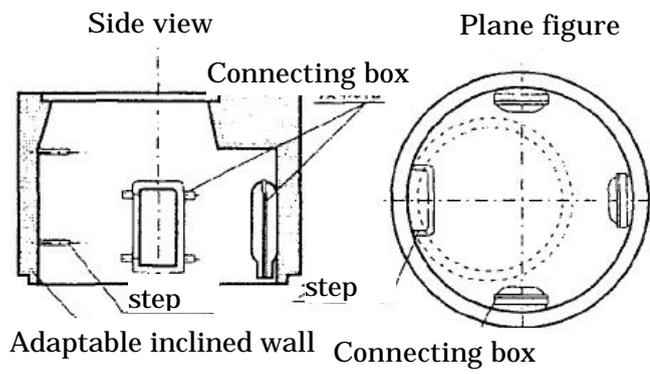


Fig.3 Adaptable manhole

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Key Words

Optical fiber cable, adaptable sewer, adaptable manhole