

Investigation and research on rationalization and speedup of the pipe line construction

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(Purpose)

In the situation in which sewerage penetration ratio exceeded at national average of 50%, the emphasis of the popularization has shifted to the small and medium municipality from big city. Rationalization and speedup of the pipe line construction have been required in order to efficiently promote the improvement of sewerage in these regions.

In this study, the problem for rationalization and speedup related to pipe line installation method was arranged, while present state of materials and construction technologies on pipe line installation method was grasped.

(Result)

(1) Arrangement of present state of the pipe line materials.

Within the pipe line materials, from the materials that have been ever used abundantly in sewer, manhole, machine hole and inlet to recent new materials, the history of development and types, features, performance and strength, etc. were arranged.

(2) Present state of pipe line laying method

In the laying construction of pipe line, the construction by open-cut method occupies about 90% of the whole works, and in the pipe diameter, the proportion of small diameter of 450mm or less occupies 92% of whole.

(3) Analysis of the component according to kind of construction by open-cut method

On the open-cut method mainly adopted in the pipe line laying construction, that how much each components of pipe kind, excavator, sheet pile and timber support influenced construction cost is, was estimated in five cases. As the result, that use light material for pipes, the small machine for excavator, lightening material for timber support seems to reduce construction cost.

And, as a kind of construction independence component, it was classified into the excavation, back filling, temporary, pipe laying, manhole installation, collecting sewer installation and pavement construction, as a result that analyzed cost composition of each cases the cost of construction equipment is high in proportion to pavement construction and manpower cost are high in temporary construction, and the material cost is high in back filling work, temporary work and pavement work.

(4) Arrangement of the problems for rationalization and speedup of pipe line installation method

The problem for rationalization and speedup of pipe line installation method was respectively arranged at plan stage, design stage, construction stage, development of the pipe line material, every elements of the execution system. For that, by classifying kind of construction independence "countermeasure" and "effect" in the open-cut method into material and construction equipment, the problem in the construction stage in which the effect seemed to be a high for rationalization and speedup was shown.

From this research, on the materials the lightening material is started to use for the pipe line, material strengthening, lengthen, simplification of the joint. And, on installation method itself for use of the lightening scaffolding material and miniaturization and performance enhancement of construction equipment, mechanization and labor saving of the manpower part, etc. were connected to the rationalization and speedup of pipe line installation method

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Key Words

Rationalization of construction, speedup of construction, pipeline material, pipeline installation method