Research on saving area system of the shield launch shaft lot (Ⅲ)		
Period	1999.6～2001.3	69P～74P

(Purpose)

It is becoming difficult for the security of the shaft lot in the shield construction of the urban area year by year, even if the sites such as park and open space are provided for plan, there are many cases that the standard facilities can not be located due to the inadequacy of the area or the shape of provided site. In order to solve these constraint matters, the saving area system is developed as a technology that can save the space of the launch shaft lot, with the aims of establishment of new elemental technology, environmental countermeasure, and cost reduction. By combining newly developed elemental technology with improved traditional technology, it is possible to save space by conventional 1/2～1/3 in term of the necessary area.

By this organization " saving area system" is studied since 1993, and "design manual (draft) 〔 the muddy-water-method shield edition 〕 " has been issued in June, 1999.

In this study, it carries out research and development of saving area system on earth pressure shield tunneling with aim at arranging[the earth pressure shield edition]as "design manual ".In addition, the decreasing rate by transportation distance of solid recovery rate in muddy-water-method shield tunneling is tested, and the result is arranged as "revised edition in fiscal design manual [the muddy-water-method shield edition] 2000".

(Result)

1. Relation technology of earth pressure shield

(1) Equipment used in tunnel(soil transfer facility, gravel crush facility)

The soil transfer facility is made save area by the miniaturization of facilities which is related to removing soil in continue excavation, and it is possible to improve the degree of freedom of arrangement of ground utilities, while work environment of underground mining and ground is maintained.

In this study, the approach of the soil transfer was arranged, the technical examination for expanding the constraint condition by soil was carried out, and gravel crush facility which the line crusher is directly connected with the screw conveyor was developed. By this, it became correspondent the gravel soil for transfer by pumping. The features of gravel transfer facility are as following.

①By improving freedom degree of arrangement of ground utilities, the saving area can be achieved .

②It is suit for the long distance tunneling.

③the Work environment and safety are improved because soil is perfectly transferred by closed gravel carrier which remove and transportation are set in different system.

(2) Ground equipment (overhead crane (the span is variable))

For the grotesque launch shaft, the variable span overhead crane which can efficiently transfer and arrange facilities and materials was developed.

2. Relation technology of muddy-water-method shield

It carried out transfer experiment in order to grasp the dissolved rate (decreasing rate of solid recovery rate) of cohesive soil recovered by solid recovery system of solid mixes with muddy water during transportation, and the reference materials as plan the secondary treatment facility were made.

①In comparatively soft clay ($10 \leqq N < 20$), the average decreasing rate is about 0.65 regardless of the content rate of fine (silt, clay).

②In comparatively still clay ($30 \leqq N$), the decreasing rate rises, with the increasing of fine (silt, clay).

Collaborators : Japan institute of Wastewater Engineering Technology, TODA Co..

Researchers: Nakazato Takuzi,Itikawa Yuuiti,Soga Seii,Katou Masaharu

Key Words	Area saving gravel, transfer facility, gravel crush facility, solid recovery system