

### **3. Development of Non-SC Type High Density Slurry Shield Machine —The Confirmation of the Performance of the New Earth Removal System—**

**Takashi Misawa, Eiichi Hatayama, Takeshi Sasaki,  
Kenichi Sasaki, Hiroaki Muranaka**

For the purpose of improvement of the underground working environment in high-density slurry shield tunneling method and improvement in the workability, Non-SC type-high density slurry shield machine with the new earth removal system which did not use the screw conveyor was developed. This system has been composed of mixing equipment and gravel carrier device. The mixing equipment uniformly kneads the excavated soil, and it is reformed in the property for the pipe carrier. The gravel carrier device regulates the earth removal quantity and controls face earth pressure by controlling the rotational frequency of the disk board. It was applied in the field, after the performance of the new earth removal system was confirmed by various element experiments. As the result, it was confirmed that the workability in the tail of shield was improved and that it is also excellent in the workability in the beginning propulsion.

**Key words:** high-density slurry shield, earth removal, and screw conveyor