8. Development of a Method for Constructing a Small-diameter Circular Shaft using Steel Sheet Piles

Shigeki Kinoshita, Eisuke Kawashima, Kazuya Syoji, Yoshiyuki Nakano

When constructing a shaft while adopting a small- to medium-diameter pipe jacking method or shield tunneling method, a rectangular sheet pile shaft with a diameter of approximately 9.0 m or a steel caisson with a diameter of the same size is adopted in numerous cases in view of the total length of the tunnel boring machine. In order to meet such social needs as the reduction of environmental burden, cost and construction period, however, new less costly shaft construction methods have been required recently. In this study, efforts were made to establish a method for constructing a small-diameter circular shaft using steel sheet piles with a view to constructing circular shafts with steel sheet piles at low cost as circular shafts are structurally superior to rectangular ones. For driving steel sheet piles, a jacking method was adopted to reduce environmental burden based on the assumption of shaft construction in urban areas. Completion of design and safety were also verified by measuring the changes in displacement of the retaining walls and the stress in circular supports during the construction of a shaft.

Key words : circular shaft, steel sheet pile, small-diameter