

Three-dimensional finite element numerical simulation research of seepage control for deep foundation pit dewatering

Zu-jiang LUO

Summary

Aiming at deep foundation pit dewatering in the Yangtze River Delta, it is easy to make a dramatic decrease of the underground water level surrounding the dewatering area and cause land subsidence and geologic disasters. In this paper, three-dimensional finite element simulation method was applied in the forth subway of Dong Jia-du tunnel repair foundation pit dewatering in Shanghai. In order to control the decrease of the underground water level around foundation pit, the foundation pit dewatering method was used to design the optimization project of dewatering, which was simulated under these conditions which the aquifers deposited layer by layer, the bottom of the aquifers went deep to 144.45m, the retaining wall of foundation pit shield went deep to 65m, the filters of the extraction wells were located between 44m to 59m, the water level in the deep foundation pit was decreased by 34m, and the maximum decrease of water level outside the foundation pit was 3m. It is shown that the optimization project and the practical case are consistent with each other. Accordingly, three dimension finite element numerical simulation is the basic theory of optimization design of engineering structures of dewatering in deep foundation pit in such areas.

