지중열교환기용 고성능 시멘트 그라우트 실증 적용

*양 희정, **이 동철, **전 중규, **서 신석, **최 용민

An Empirical application of high-performance cement grout for ground heat exchanger

* Hee-Jung Yang, **Dong-Chul Lee, **Joong-Kyu Jeon,**Shin-Seok Seo, **Yong-Min Choi

Ground heat exchanger is the most important part which than 14% of the cost of construction and the performance of Ground heat exchanger is depended on it. Grout is inserted into the hole to the ground fixed and serves to enhance the thermal conductivity. So the research and development is needed. We were using cement grout. The result of the test thermal conductivity is 3.14 W/mK. It is much better than the existing grout is the thermal conductivity. The developed materials was examined by applying the grout in the field.

Key words : Ground heat exchanger(지중열교환기), Cement(시멘트), Thermal Conductivity(열전도도)

E-mail : *hjyang@kolon.com

친수지역 강변여과수 열원을 활용한 냉난방시스템 개발

*조 용, 김 대근, 문 종필

Development of Water-Source Heat Pump System Using Riverbank Filtration Water on the Waterfront

*Yong Cho, Dea Geun Kim, Jong-pil Moon

A water-source heat pump system has been developed for cooling and heating of a green house on the waterfront in Jinju. In order to supply a heat source/sink of water in alluvium aquifer to the heat pump system, the riverbank filtration facility (two pumping wells and one recharge well) for water intake and injection has been constructed. To pump and recharge water sufficiently, the geometric design such as depth and diameter for the wells have been completed, and details of the well such as slot size and length of the screen and filter pack size have been designed based on the practical and theoretical design method including D30 technique. For the investigation of the hydrogeological characteristics, step-drawdown test, long-term pumping test, and recovery test have been carried out for two developed pumping wells. Step-drawdown test has been performed on 4 step flowrates of 150, 300, 450, 600 m^3/day for 1 hour, and long-term pumping test on flowrate of 500 m^3/day for 24 hours, and recovery test for 6 hours. Since the underground water filtrated by riverbank is flowing smoothly into the well, the water level goes down slightly for the long-term test. Consequently, the stable pumping flowrate for two pumping well has been predicted at least over 1,647 m^3/day which is larger than the flowrate of 1,000 m^3/day for a 60 RT heat pump system.

Key words : Riverbank Filtration(강변여과), Alluvium Aquifer(충적대수층), Temperature Difference Energy(온도차 에너지), Water Source Heat Pump(수열원 히트펌프), Ground Water Heat Pump(지하수 히트펌프)

E-mail : *ycho@kwater.or.kr