Thesis Title	The Cooling Potential of Buried Pipes Heat Exchanger
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Abstract

The main objective of this thesis is to construct and evaluate the potential of buried pipes to reduce ambient air temperatures. Various parameter that influence the performance of the pips such as pipe ring, pipe length, pipe depth, air flow rate and ambient air temperature has been studied. The studied pipe system consists of two 6 inch plastic pipes and an 8 inch pipe as the depth of 0.8, 1.6 and 0.8 meter respectively. The length of each pipe is 32 m. The air flow rate is set as 1, 3 and 5 m/s during the experiment. The results of the experiments showed that the temperature of air entering the pipe have strong effect on the cooling potential of the pipe system. High ambient air temperature cause high temperature difference between air and soil temperature and result in high degree reduction. The pipe buried at 1.6 m depth has more cooling potential than the pipe at 0.8 m. The lengths of pipe also have strong effect on cooling potential of the system. The existing length of the experimental system at 32 m is adequate for the 5 m/s of air velocity. However, the lower air velocity needs shorter pipe length. The pipe diameter effects not only the mass flow rate but also the cooling potential of the system high mass flow rate cause more heat transfer rate but lower temperature reduction. The temperature of the air the system can be predicted by the equation which is also suggested in this thesis.

Keywords : buried pipes / cooling / regression