

Inlet & Outlet Pipe Heat Interaction in a Contiguous Flight Auger (CFA) Pile

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Abstract

The use of energy loop(s), fitted into the structural foundation elements dualizes the role of the pile in meeting the structural performance and the thermal comfort demand of the overlying structure. Heat carrier fluid (HCF) is circulated through the loops, to extract or reject heat energy into the ground, during the space heating or cooling operation. However, this results in thermal interaction between the inlet and outlet leg of the loop especially in contiguous flight auger (CFA) piles where the loops are bunched together to a central steel bar. This paper presents a numerical study to investigate the heat flow characteristics between the inlet and outlet loops installed in a CFA pile. It was found that the central steel bar, used in a CFA pile, contributes towards higher thermal interaction. Similarly, it was found that the use of plastic bar of adequate strength, to substitute the use of steel bar, has both economic advantage and positive significance on the performance of the CFA pile.