

ABSTRACT:

An optical fiber strain sensing technique, based on Brillouin Optical Time Domain Reflectometry (BOTDR), was used to monitor the performance of a secant pile wall subjected to multiple props during construction of an adjacent basement in London. Details of the installation of sensors as well as data processing are described. Distributed strain profiles were obtained by deriving strain measurements from optical fibers installed on opposite sides of the pile to allow monitoring of both axial and lateral movements along the pile. Methods for analyzing the thermal strain and temperature compensation are also presented. Measurements obtained from the BOTDR were found to be in good agreement with inclinometer data from the adjacent piles. The relative merits of the two different techniques are discussed.