

Condition Assessment Of Pile Foundations Embedded In Soil

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Piles are common foundation structures that provide support for infrastructure that protect property, environment, and lives from floods, and facilitate navigation along the United States river systems. Much of the piling throughout the United States water resources infrastructure inventory is over 50 years old. There is no means to inspect the pile foundations that are embedded in soil. This leads to significant risk-based budgetary processes to consider the piles functional since there is no evidence to suggest they have deteriorated. The consequences of their unknown conditions could produce massive risk to the nation's infrastructure inventory. The main purpose of this research is to determine effective methods to properly evaluate the condition of both timber and steel pilings. An extensive literature review on the most advanced NDT techniques for condition assessment of in-situ wood and steel pilings was reported. A few NDT methods were proposed to assess the condition of timber and steel piles, and a comprehensive experimental program was conducted. Two pairs of timber piles and steel H-piles were non-destructively tested. Both non-damaged and damaged piles were evaluated. The test parameters included piling type and defect size. Four NDT methods: namely bending wave, dispersive wave, combinations of dispersive-bending wave, and parallel seismic were employed. Conclusions related to the ability of these NDT/NDE methods to detect the current condition of piles were provided.