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Investigation of Vertical Members to Resist Surficial Slope Instabilities WHRP Project [0092-05-09](#)

The paper(s) abstracted below report recent research that may be related to the subject matter or methodologies of this WHRP project. For access to the CD-ROM and full text of the paper, contact Hussain Bahia (bahia@engr.wisc.edu) or Greg Waidley (gwaidley@engr.wisc.edu) at WHRP or John Cherney (john.cherney@dot.state.wi.us) at the WisDOT Library.

Testing and Evaluation of Driven Plate Piles in a Full Size Test Slope: A New Method for Stabilizing Shallow Landslides

Paper No. 06-0299

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Abstract: Shallow rainfall induced landslides in residual and colluvial hillslopes and steep embankments are a common occurrence in many settings. While occasionally posing a threat to property and life-safety, they more often present an ongoing maintenance problem. The Blackhawk Geologic Hazard Abatement District has developed a program to research and develop less costly techniques for arresting unstable slope conditions. To address these types of failures, a new slope stability mitigation technique was developed consisting of inserting 6-foot long steel piles into and through a potential shallow landslide area. The piles are outfitted with a rectangular steel plate at one end which acts to resist down slope movements of shallow failure masses. The method is a low cost solution for dealing with shallow landslides and has been utilized on two projects thus far. As part of a development program sponsored by the District for this mitigation technique, a full-scale landslide test facility was constructed. The test site consists of a 30-foot long by 12-foot wide concrete slope built at a 26.6° inclination upon which landslides and plate pile configurations are tested. The test program has consisted of initiating landslides under extreme saturated conditions on slopes outfitted with and without plate piles. Analyses indicate the technique can increase the factor of safety of shallow depth slopes by between 20% and 50%. Additionally, the cost of the method has been demonstrated to be 1/6th to 1/10th the cost of the “remove and replacement” method for preventing or stabilizing failing native slopes and embankments.