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Prototype damper for use in deep foundation pile testing

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ABSTRACT

A new method of testing deep foundation piles is proposed, focusing specifically on rapid load testing. The test involves applying a controlled force to a pile by dropping a weight and damper on it. The specific damper provided required modification of the annular gap to accommodate the magneto-rheological fluid, which replaces the hydraulic fluid. Two accelerometers and one K-type thermocouple monitor the damper by means of a control circuit with a programmable micro-controller. The control circuit bus impedance and board capacitance are evaluated. The control circuit outputs a signal which switches a coil housed inside the damper. This coil generates a field in the annular gap that changes the amount of damping, and consequently alters the applied force. With a control algorithm implemented, it is possible to attain the desired impact on a pile, potentially giving an insight into its load bearing capabilities.