

Integrity Testing of Deep Foundation Piles

PileInspect is a three year research project sponsored by the European Commission under the Seventh Framework Programme (FP7) — Research for the benefit of the SME Associations

THE TOPIC

A hundred thousand kilometres of piles are installed yearly in Europe. If a failure is not detected during installation of a pile, the results can be more catastrophic with extremely high cost for a single failure.

Current pile inspection techniques involve dynamic load or sonic integrity testing. These are relatively fast to perform. However, the quality of results depends strongly on the skill of the operator and the results are always open to interpretation. Some studies also indicate that defects representing less than 50% of cross sectional area are not detectable via sonic integrity testing.



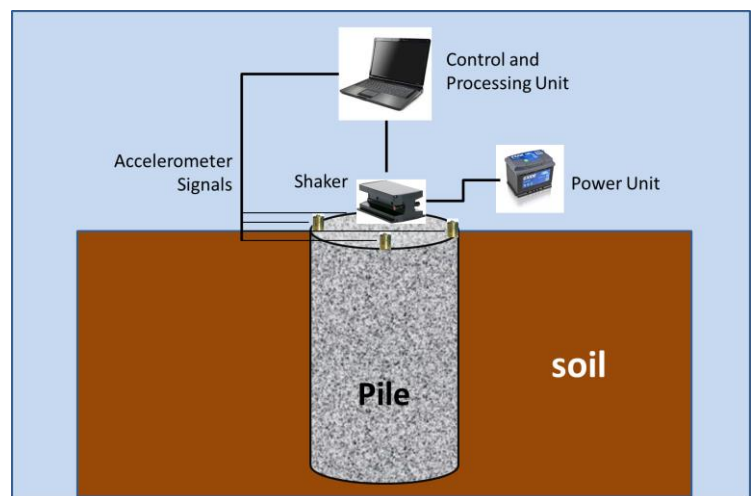
A defective pile

PROJECT OBJECTIVES

PileInspect aims to develop 'best practice' for inspecting the integrity of cast-in-place and pre-cast concrete piles and of steel piles.

We propose PileInspect system:

- to replace the instrumented hammer and pile driving hammer with a portable shaker which will ensure repeatable, tailored excitation spectra, and should dramatically improve estimation accuracy of diagnostic features;
- to employ highly innovative signal processing methodologies (based on higher order spectral and impulse response function) in order to increase the quality of diagnosis and perform automatic defect recognition.



Schematic diagram of PileInspect system

PROJECT WORKSHOP

Workshop programme:

- 10am – Welcome and BIC introduction (Dr Cem Selcuk, BIC)
- 10.15am – PileInspect project introduction (Professor Peter Trampus, project coordinator, HANDT, Hungary)
- 10.30am – Current pile integrity testing practice and limitations
 - Tony Butcher, BRE, UK
 - Huw Williams, Testconsult, UK
 - Dr Oswald Klingmueller, GSP, Germany
- 1pm – 4pm Research performance to date
 - Dr Ernst Niederleithinger, BAM, Germany
 - Dr Haitao Zheng, BIC, UK
 - Dr Ivan Petrunin & Dr Serhan Kirlangic, Cranfield, UK
 - Optional PileInspect system Demo and Tour of BIC and TWI

*Allocated time per speaker 30 minutes (20 minutes talk + 10 minutes Q&A)
Coffee and lunch (12 pm) will be provided*

The PileInspect workshop is to be held on 17th November 2016 at BIC - TWI, Granta Park, Cambridge, CB21 6AL, UK

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PROJECT CONSORTIUM

The consortium comprises of 10 partners from 6 EU states:

- **HANDT (HUNGARY)** - HUNGARIAN ASSOCIATION FOR NONDESTRUCTIVE TESTING (MAROVISZ);
- **DFI (NETHERLAND)** - DFI EUROPE VERENIGING;
- **AEND (SPAIN)** - ASOCIACION ESPAÑOLA DE ENSAYOS NO DESTRUCTIVOS;
- **PileTest (POLAND)** - PILETEST SP ZOO;
- **GSP (GERMANY)** - GSP GESELLSCHAFT FÜR SCHWINGUNGSUNTERSUCHUNGEN UND DYNAMISCHE PRUFMETHODEN MBH;
- **BMNED (NETHERLAND)** - BOUWSERVICE MANAGEMENT NEDERLAND BV;
- **AARSLEFF (UK)** - PER AARSLEFF (UK) LTD;
- **Cranfield (UK)** - CRANFIELD UNIVERSITY;
- **BAM (GERMANY)** - FEDERAL INSTITUTE FOR MATERIALS RESEARCH AND TESTING;
- **Brunel Innovation Centre (BIC) of UBrun (UK)** - BRUNEL UNIVERSITY



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