



# PDA

## Pile Driving Analysis

### The purpose of Pile Driving Analysis

Pile Driving Analysis (PDA) is a powerful tool to control the pile driving process. During driving, the performance of the hammer, the condition of the cushion, the behavior of the pile, and the driving resistance of the soil can be analyzed and monitored.



*Pile monitoring with PDA.*

The extra knowledge obtained by performing Pile Driving Analysis can pay for itself many times over. The risk of damage to the pile or hammer is reduced. The risk of damage to the superstructure caused by failure of the foundation is reduced. The final depth of driving can be optimised, which may result in a shorter pile length. For future projects, prediction of pile driving and selection of the correct hammer is facilitated. A quality record of each pile can be supplied to the clients and authorities.

### Performing PDA monitoring

A pile test can be set up in less than a quarter of an hour. Two sensors are connected to the pile near the pile head. The sensors have a combined function: to measure strain and acceleration. On pre-cast concrete piles, the sensors are connected to the pile with anchor bolts. On steel piles, the sensors are bolted to the pile using threaded holes or welded mounting blocks. Special sensors for underwater use are available. All sensors may be recovered after driving. After the sensors have been connected, menu driven software directs test controls.

Pile driving may start immediately. During driving, data is stored automatically on hard disk for back-analysis and generation of field reports. The signals from the sensors are processed by the signal

conditioner, analyzed by the FPDS software, and stored in digital form on the internal hard disk. The stored signals can be retrieved and processed during the post-processing option.

### Information obtained from PDA

During driving, for each hammer blow, information is given for: blow number, blow count, blow rate, maximum compression and tension stress in the pile, transferred energy, driving resistance, shaft friction and toe resistance, bending moment, maximum acceleration, pile structural integrity, and the extent and location of any damage.

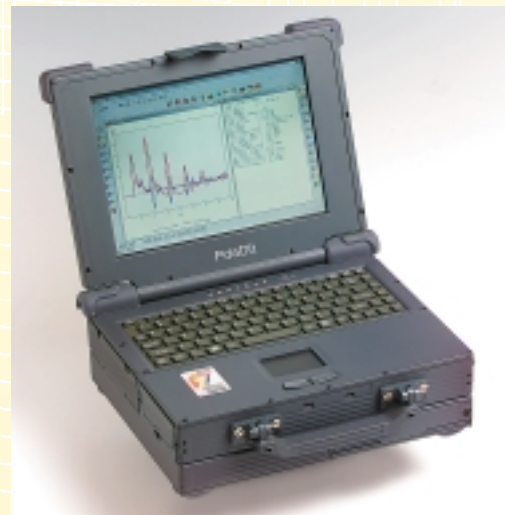
The signals and other information can be presented immediately on screen. A selection of the available graphs, all presented as a function of time and scaled in engineering units, include:

- measured signals;
- transferred energy;
- acceleration, force, velocity, and displacement at the sensor location;
- force and velocity x impedance;
- downward travelling waves;
- upward travelling waves;
- driving resistance;
- estimate of static resistance.

The results are presented in either SI or English units. A report generator program allows the presentation of a field report immediately after driving. The system gives warnings and other "expert advice".

### The PDA equipment

The FPDS-7 PDA system has been upgraded and operates under Windows. It consists of an FPDS system



*PDA monitoring equipment.*