



# PARAS

Parallel seismic tester



## PARAS is a secure and speedy way to assess sub-structure foundations.

Designed to check the depth and integrity of concrete, masonry or steel foundations that are considered to be inaccessible or where other non-destructive methods are of little use; PARAS offers an alternative testing method where conventional pile testing techniques may be inappropriate.

The test requires an access tube to be installed parallel to the pile or sheet piling to be tested. The PARAS system measures the time taken for a signal to travel from a hammer impact point, to a hydrophone transducer as it is lowered down the access tube. A change in the signal arrival time indicates the depth of the foundation.

Housed in a rugged plastic case with high quality waterproof connectors, this lightweight and portable signal acquisition and analysis unit, is designed for testing in all weathers.

## Software

The PARAS analysis software is supplied as standard and incorporates filters for screening data, with the ability to quickly review and analyse each individual test result.

Signals can be analysed in positive, negative or bi-polarity and the threshold for first arrival detection varied. Cursors can be set to follow first arrival times (FAT) over the concrete zone and over the soil zone below the pile.

The depth of continuous concrete is determined automatically by the intersection point of the concrete and soil velocity cursors, and marked on the test report. All curves are plotted as a waterfall plot with on screen cursors to define the concrete wave speed, soil wave speed and the intersection corresponding to the foundation depth.

## Benefits

- Easy to handle and transport between test locations
- Compliant with NFP94-160-3
- Backlit screen for working in dark environments
- Storage for over 700 results
- Can be combined with TDR2 pile testing system
- Operates for up to 8 hours on full charge
- Full equipment training available
- James Fisher Testing Services complete test package available



## How it works

Before testing, it is necessary to install a plastic tube to within 500mm (maximum), parallel to the pile or sheet piling that is to be tested. This tube should have a closed end and be taken to a depth beyond that which you require, and grouted into place using bentonite or similar.

The tube is generally 50mm in diameter and once installed, is filled with clean water to act as an acoustic coupling with the hydrophone.

To perform the test the hydrophone is lowered down the tube in increments of 500mm. At each step the side of the pile / structure is struck and the hydrophone records the resultant signal from the moment of impact.

As the hydrophone descends the signal will resolve itself, and the arrival time will gradually increase linearly with the depth, as it passes through (providing the tube is parallel with the pile).

When the hydrophone reaches the base of the pile, the additional signal path is through soil, not steel or concrete, and the first arrival time (FAT) will increase at a greater rate.

The depth of the foundation is determined by the depth at which the rate of first arrival changes.



| PARAS unit            |  |
|-----------------------|--|
| Features              | Twin channel hand held spectrum analyser<br>Daylight viewable screen<br>Tactile large keys for operating with gloves<br>Low power with long battery life<br>Flash memory for instant start up and power down<br>Rugged lightweight unit with waterproof connectors |
| Keypad                | Sealed colour coded and full alphanumeric keypad, tactile and audio feedback   |
| Operating temperature | 0 to +50°C   |
| Screen                | Monochrome LCD transfective with backlight<br>Contrast keypad adjustable<br>Display area 122mm x 70mm<br>Protective anti-reflective glass  |
| Acquisition           | 2 channel, 16 bit acquisition at 25KHz sample rate<br>Pre-trigger on both channels, auto-ranging gain feature  |
| Frequency range       | 0Hz to 5000Hz  |
| Storage               | 700+ results, with full header information including site, pile no, operator, transducers and date/time stamp  |
| Depth                 | Up to 50m  |
| Displays              | Velocity-time signal: At each test depth increment<br>Waterfall plot of all time signals taken on the same test  |
| Power                 | Battery: 1.2V NiMH rechargeable AA cells<br>Auto power off and battery indicator   |
| Battery life          | 8 hours + on full charge   |
| Charge time           | Approx 6 hours   |
| Charging              | External wall plug-in charger for 100/110/250VAC inputs (trickle charge)<br>External cigar plug-in charger for 12VDC inputs (fast charge)  |
| Dimensions            | L 218mm x W 187mm x D 55mm   |
| Weight                | 1.35Kg   |

| Impulse hammer  |  |
|-----------------|--|
| Type            | Constant current load cell                         |
| Weight          | 1.2Kg with fibre glass shaft                       |
| Nominal output  | 0.15 volts/N                                       |
| Frequency range | 0-1000Hz (black tip)<br>500-5000Hz (aluminium tip) |
| Range           | 0-10,000N  |

| Hydrophone |                                     |
|------------|-------------------------------------|
| Type       | Piezo-ceramic sensor                |
| Dimensions | L 300mm x D 25mm                    |
| Connection | Waterproof hi-pressure Jupiter type |
| Cable      | 50m reel with 0.5m cable markers    |

**All of our equipment is supplied fully calibrated to UK national standards.**

## PARAS user training

We provide full training for all equipment purchased from JFTS. Our training sessions are created and led by our in-house experts, providing you with the skills and knowledge needed to operate the equipment safely, efficiently and with confidence.

We offer classroom and site training within the UK, on-site training overseas and virtual classroom training. No matter what your needs or technical experience we can provide the right training solution for your requirements.

