



SIMBAT

Dynamic pile test system



SIMBAT is widely regarded as the most accurate high strain dynamic testing method available.

Suitable for both cast-in place and pre-cast piles, the SIMBAT technique was first developed in the 1980's before being further developed by James Fisher Testing Services and gained in popularity over traditional dynamic testing techniques.

The core differences between SIMBAT and more traditional dynamic testing techniques are:

- A high speed optical / digital theodolite is used to record real-time displacement
- A series of high and low strain blows are used so reactions are determined without assuming soil damping factors
- Displacement data from the theodolite is used to correct accelerometer data
- Simulation model is based on accurate displacement rather than calculated velocity

These differences mean that SIMBAT has been independently rated as the most accurate high strain dynamic testing method available.

Benefits

- Most accurate high strain dynamic testing method available
- Unique theodolite measures elastic and permanent displacement remotely
- Instant dynamic reaction and displacement readings
- Rugged and lightweight, hand-held acquisition unit
- Storage for over 700 results
- Backlit LCD screen for working in dark environments
- James Fisher Testing Services complete test package available



Software

The SIMBAT software is an easy to use Windows based platform for analysing results and producing reports.

Modules enable you to calculate the impedance of the pile test cap and pile shaft separately, as well as analyse each blow individually to determine dynamic reaction and displacement.

The software can present results in tabular format, as well as presenting the separation of forces curves and the predicated static load settlement plot.

An integral part of the SIMBAT software is a numerical simulation, whereby experimental signals are introduced into the programme and compared with theoretically generated signals. Skin friction and end bearing components of the pile / soil system can then be derived.

How it works

The SIMBAT method is based on the reproduction of waves in long elastic cylinders.

When the pile is struck with a falling weight the pile section is deformed (enlarged) and this enlargement travels down the pile to the toe where it is reflected back up. In a free, un-damped pile the particle velocity of the return wave would be identical to the original wave.

When the pile is surrounded and re-strained by soil, part of the wave is reflected back up at each and every external restraint, the remainder of the wave continues downwards. So at any one time there are both upwards and downwards forces and velocities in the pile.

The SIMBAT technique separates these forces and calculates the dynamic soil reaction, as the difference between the upwards force in a free pile and the real upwards force measured.

SIMBAT 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.

Logging unit hardware	
Features	Daylight viewable screen Tactile large keys for operating with gloves Low power with long battery life Flash memory for instant start up and power down Instant dynamic reaction and displacement readings Rugged lightweight unit with waterproof connectors
Keypad	Sealed colour coded and full alphanumeric keypad, tactile and audio feedback
Operating temperature	0 to +50°C
Display	Monochrome LCD transfective with backlight Contrast adjustable keypad Display area 122mm x 70mm Protective anti-reflective glass
Acquisition	4 channel, 16 bit acquisition at 10KHz sample rate Pre-trigger, auto gain and auto balancing of strain gauges
Frequency range	10KHz
Storage	700+ results including data sets for force, acceleration, displacement per pile with full header information and date/time stamp
Connectors	Waterproof lemo type, each with unique configuration
Power	Battery: 1.2V NiMH rechargeable AA cells Auto power off and battery indicator
Battery life	8 hours + operation on full charge
Charge time	Approx 6 hours
Charging	External wall plug-in adapter for 110-240VAC inputs (trickle charge) External cigar plug-in charger for 12-32VDC inputs (fast charge)
Dimensions	L 128mm x W 187mm x D 55mm
Weight	1.35Kg

Theodolite	
Type	High speed optical theodolite with laser targeting and LED target illumination Measures elastic and permanent settlement
Battery	NiMH rechargeable, 6 hours + on full charge
Charger	External wall plug-in adapter for 110-240VAC inputs External cigar plug-in charger for 12-32VDC inputs
Accuracy	0.14mm at 5m distance

SIMBAT sensors	
Accelerometers	2No 5000g 'shock' type with ICP power supply
Strain gauges	60mm foil type strain gauges

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

