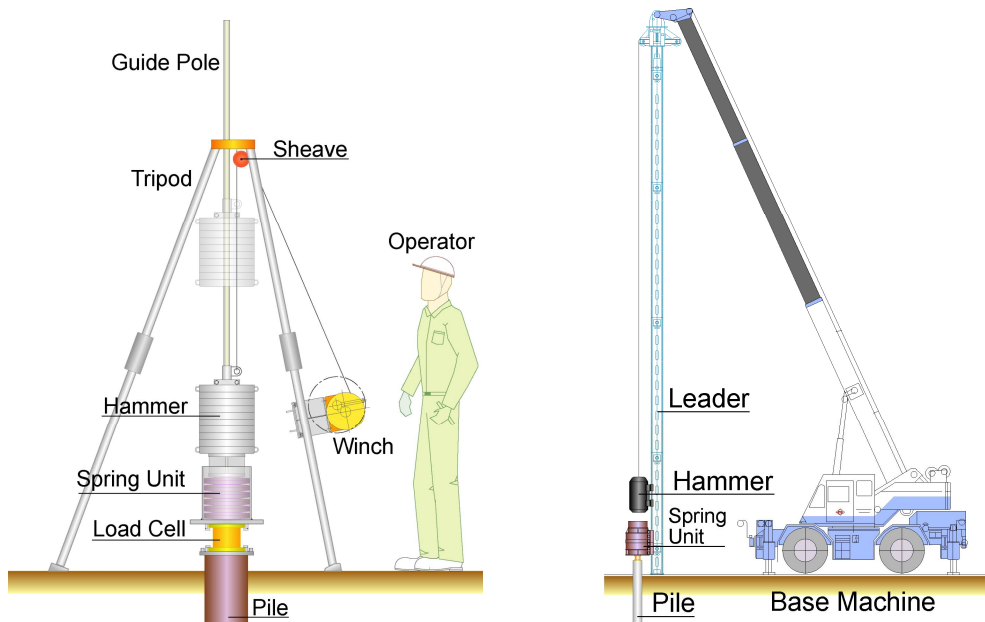


A.3 Spring Hammer Test Device

The loading mechanism of the Spring Hammer Test Device (SH device) is similar to that of the Pseudo-Static Pile Load Tester, except that the spring unit is placed on the pile head in the SH test. Two types of the SH device, portable and machine-mounted types, are available as shown in Fig. A3-1 and Table A3-1. Coned disk springs are used to constitute a spring unit. The performance of the SH device can be easily controlled by changing the combination of the hammer mass and the spring value as well as the falling height of the hammer. One of advantages of the SH device is that repetitive loading can be easily done.

The applied force and the accelerations at the pile head are measured. Direct measurement of the displacement is possible by means of laser displacement meter or optical displacement meter. All the dynamic signals are recorded through a computerised signal acquisition system, and processed to estimate 'static' response of the test pile.

The SH device may be used very effectively to obtain the performance of piles having relatively low bearing capacity.



(a) Portable type (max. load = 200 kN) (b) Machine-mounted type (max. load = 2500 kN)

Fig. A3-1. Spring hammer test device.

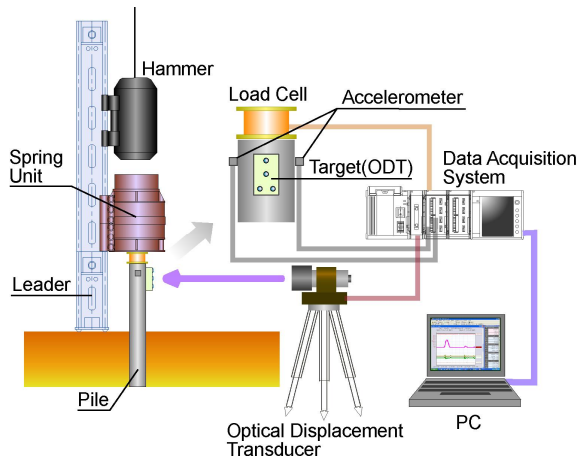


Fig. A3-2. Signal acquisition system.

Table A3-1. Standard specifications of spring hammer devices (as in 2007).

	Portable	Machine mounted
Hammer mass (ton)	0.2	3
Spring values (kN/m)	5125	35000
Max. fall height (m)	2	3
Max. load (kN)	200	2500
Weight of spring unit (kN)	1	20
Number of tests per day in usual test condition	8 to 10	5 to 7

Reference

Matsumoto, T., Wakisaka, T., Wang, F.W., Takeda, K. & Yabuuchi, N.
 Development of a rapid pile load test method using a falling mass attached with spring and damper,
 In: Proc. 7th Int. Conf. on the Appl. of Stress-Wave Theory to Piles, Selangor, Malaysia: 351-358.