

Pile Dynamic Load Test

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[Advance Geotechnical Research Institute Inc.](#)

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Pile Dynamic Load Test is a relatively new loading test method standardized in the "JGS-1816-2002" (Japan Geotechnical Engineering Society/ Standard Vertical Loading Test Method for Piles and its Commentary).

Unlike conventional static load test, DLT does not require the assembly of reaction piles or loading girders. Therefore, the test can be performed within several hours including sensor installation.

The resulting strain and acceleration of the pile are measured with a high precision while the pile is driven into the ground with a Ram or hydraulic hammer. The wave theory is applied to simulate the measured strain and acceleration, so that the total resistance of the pile (dynamic penetration resistance + static penetration resistance) can be derived. Based on the CAPWAP, dynamic penetration resistance + static penetration resistance can be separated. The static penetration resistance is equal to the bearing capacity of the pile. Furthermore, the measured results can be used to set-up the driving criteria for the End-of-Driving and/or Re-strike Driving.



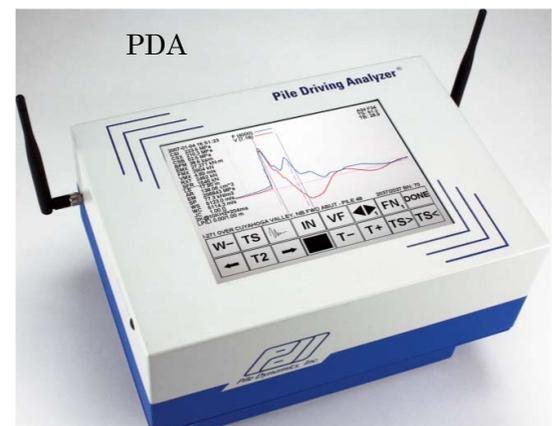
When we need to conduct the Dynamic Load Test

During pile installation, issues related to bearing capacity, such as whether the piles reach the bearing layer, whether they do not punch through the bearing layer, and whether they are consistent with the stratigraphic changes, as well as whether existing piles can be reused in redevelopment projects, are always encountered in the field. The PDA is a new system that can solve these problems, as well as save time and cost requirements.

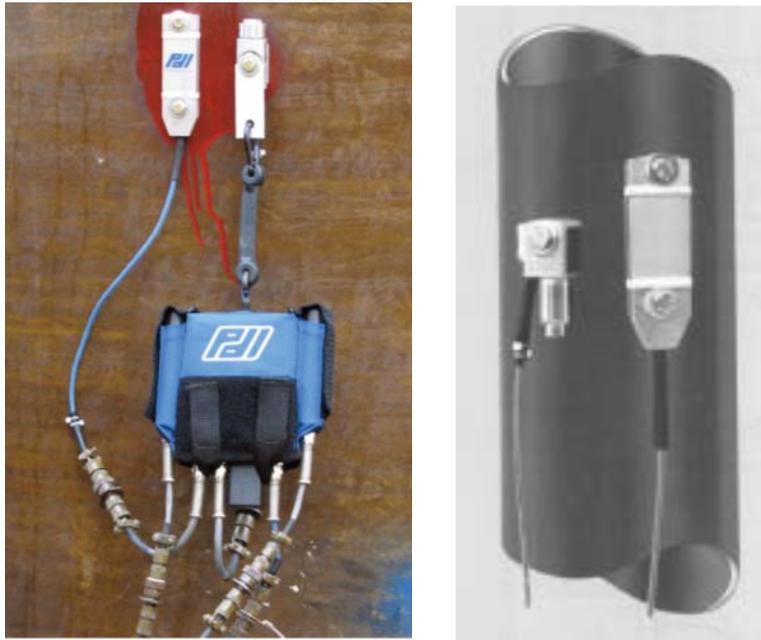
Pile Dynamic Load Tests with PDA

The PDA is a high performance pile Dynamic Load Testing device developed by Pile Dynamics, Inc. (PDI). It is the world's most widely used signal matching analysis system and diagnostic tool for evaluating all types of foundation pile mechanisms.

The PDA measuring device consists of two types of sensors (strain transducer and accelerometer), a cable, and the PDA device itself. The two pairs of the strain transducer and accelerometer can be easily attached to the pile using M6 bolts.



Strain transducer and Accelerometer

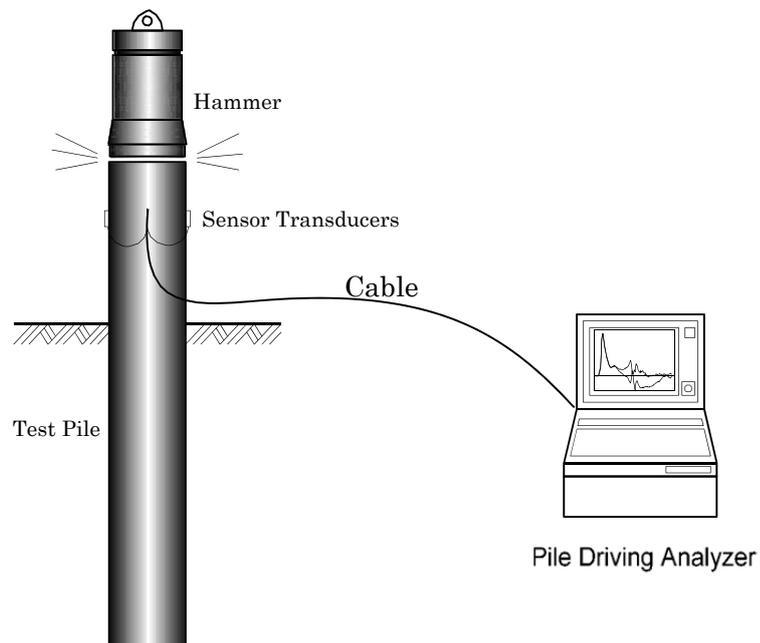


The Flow of Pile Dynamic Load Test Procedure

In the job site, the head of the pile to which the sensor is attached is first struck with a hammer, and the signals of axial strain and acceleration of the pile body during this dynamic impact are measured. The signals are sampled using a pretrigger method.

The PDA's measurement program then calculates the waveforms, and the CASE method is used to analyze the total resistance and the stress generated in the pile body. The data is then brought back to the PDA to model the pile and soil conditions and set the analysis parameters. This allows us to simulate the measured waveforms.

Waveform Matching Analysis (CAPWAP), which separates and derive the static penetration resistance component out from the total resistance, is performed and highly accurate results are reported.



Streamlining Management and Ensuring Safety

There are many situations in which it is difficult to conduct conventional static loading tests due to time and cost considerations.

PDA is a new system that has the advantages of quick testing, low cost, and early reporting of test results, and can contribute to streamlining on-site construction management and guaranteeing construction safety through more accurate data.

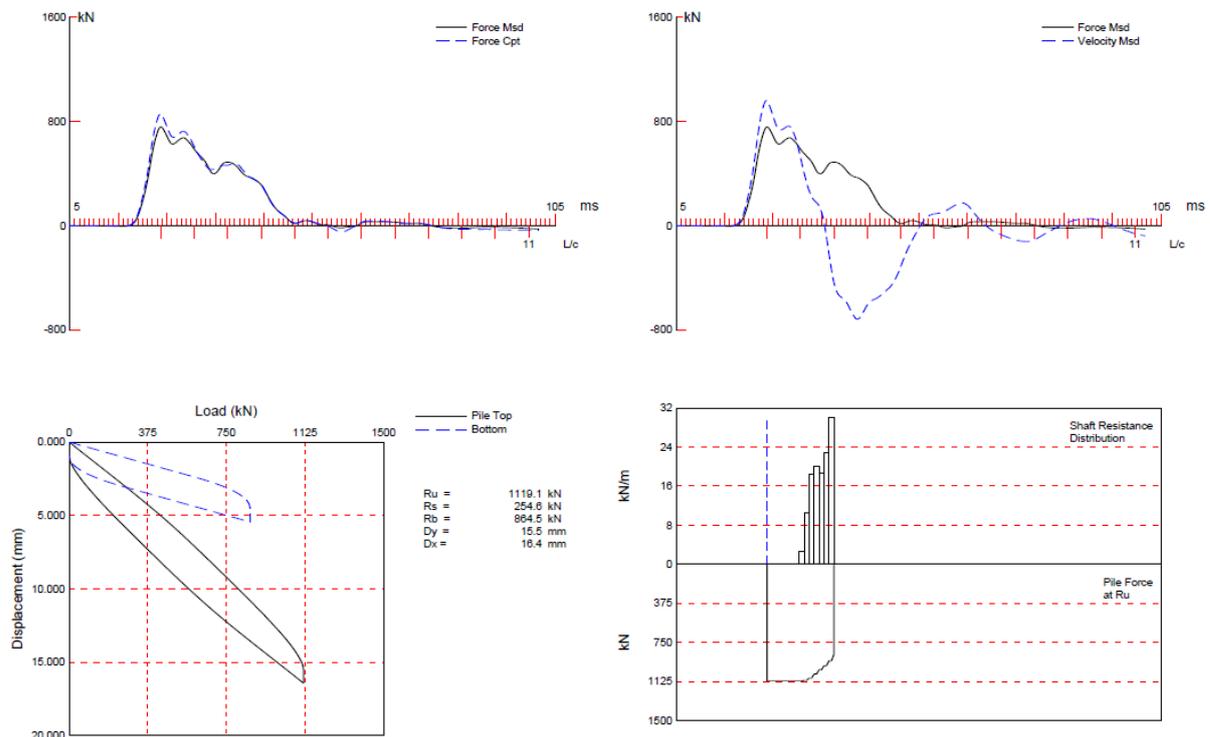
Pile Dynamic Measuring Test in Japan

"Pile Dynamic Measuring Test" based on wave theory has been in practical use since the 1970s in Europe and the United States.

In Japan, recently there has been an increase in the size of steel pipe piles to be driven into the ground and an increase in the number of construction projects in coastal and reclaimed areas with soft ground such as new urban centers and new airports etc. In addition to conventional static load test, new testing methods have become necessary. Therefore, in 1991, the Steel Pipe Pile Association of Japan established the "Bearing Capacity Promotion Committee" as a special technical committee of the Association, and started the technical development of dynamic measuring test. We have cooperated with this committee from the beginning and have been actively involved in its development and research. After the committee completed its activities, we took over the results of its research and have been promoting the spread out of Dynamic load test. Our high level of expertise and extensive experience enable us to respond to the wide range of its needs.

HANSEN; Pile: 55_3; PDA; Blow: 1 (Test: 05-Aug-2017 09:04)
AGRI

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CAPWAP(R) 2006-3 



CAPWAP(R) 2006-3 Licensed to Yamagata University

PDA Output



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