

Pile Rapid Load Test

Hybridnamic Load Test

Hybridnamic Testing® is a rapid load testing system that uses a drop weight to apply a load to the pile head.

It does not require reaction piles, which makes it a cost-effective and efficient way to measure the pile's "bearing capacity".

The Hybridnamic cushion provides an ideal rapid load, and the PDA system and PSD camera ensure high-precision measurement.

This results in a high-quality rapid load test.

Hybridnamic Testing® can be used to streamline construction management and reduce testing costs.

Advance Geotechnical Research Institute

Hybriddynamic Testing is a high-precision rapid load testing method that is very close to static load testing.

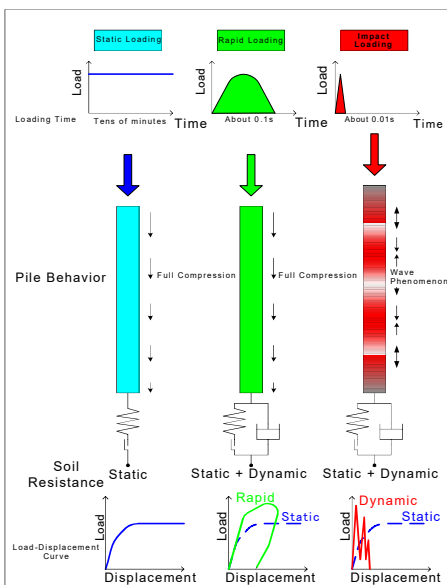


The Hybriddynamic Cushion is a honeycomb structure made of steel plates and elastomer.



Pile Rapid Load Testing

Pile rapid load testing is a new load testing method standardized by the Japanese Geotechnical Society (JGS) in "Standard for Vertical Load Testing Methods of Piles - Explanation" (JGS-1815-2002). In this method, the wave phenomenon generated in the pile body can be practically ignored, and the stress generated in the pile body during the test is close to the static result.



The behavior of the pile and the ground during the loading test

Hybriddynamic Testing

Hybriddynamic testing is an innovative rapid load testing method that eliminates the need for reaction piles and utilizes a falling weight system to apply dynamic loads to the pile. Unlike conventional rapid load testing methods, Hybriddynamic testing employs a unique Hybriddynamic cushion to deliver stable and idealized rapid loads, ensuring accurate and reliable test results. Additionally, it incorporates a PSD camera for precise displacement measurement, further enhancing the overall testing process.

Hybriddynamic Cushion

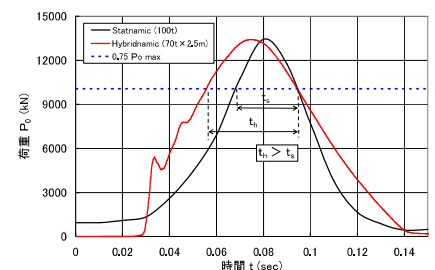
Our company's independently developed Hybriddynamic Cushion (patent pending) has a honeycomb structure of steel plates and elastomers, rapidly converting the energy from a falling weight into sudden loading transmitted to the pile head.

Its features include:

- Longer loading time near the maximum load.
- Low rebound.
- Minimal degradation of elastomers.

The rapid loading test in the Japanese Geotechnical Society standards is a dynamic loading test with a relative loading time of 5 or more. As the loading time near the maximum load increases, the behavior of the pile during the test becomes closer to that of a static loading test.

The Hybriddynamic Cushion achieves a rapid loading shape with a longer loading time near the maximum load compared to conventional loading methods, as the air inside the honeycomb structure is displaced during loading.

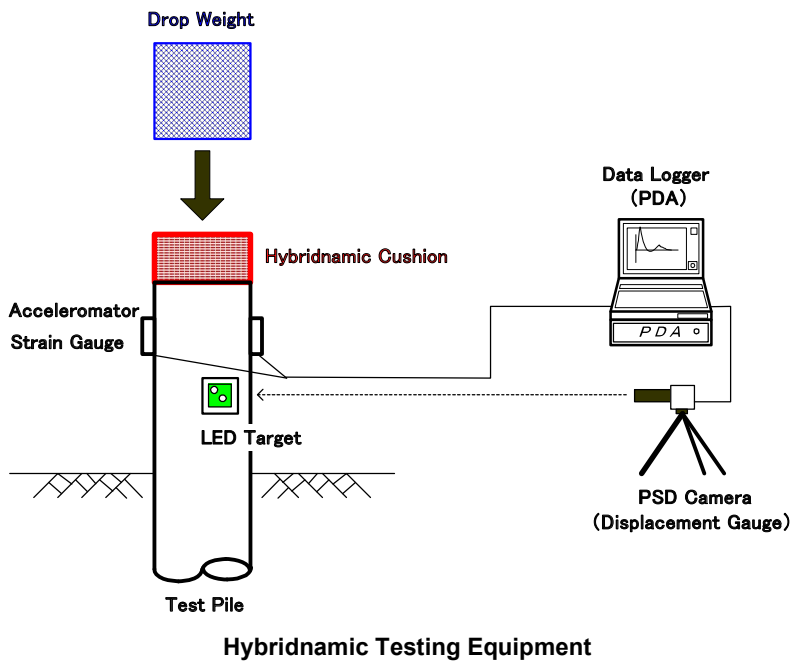


The rapid loading waveform

During the unloading process, the cushion exhibits low rebound due to delayed recovery caused by negative pressure. This results in reduced rebound of the weight.

The elastomer fused to the steel plates is constrained from lateral deformation during loading, ensuring it does not exceed its failure stress. This prevents material degradation, allowing for stable rapid loading even with repeated use.

Our company has accurately assessed the deformation performance of the Hybriddynamic Cushion through indoor compression testing. This enables us to plan precise loads and loading.



PDA



Strain Gauge, Accelerometer



Displacement Measuring LED Target



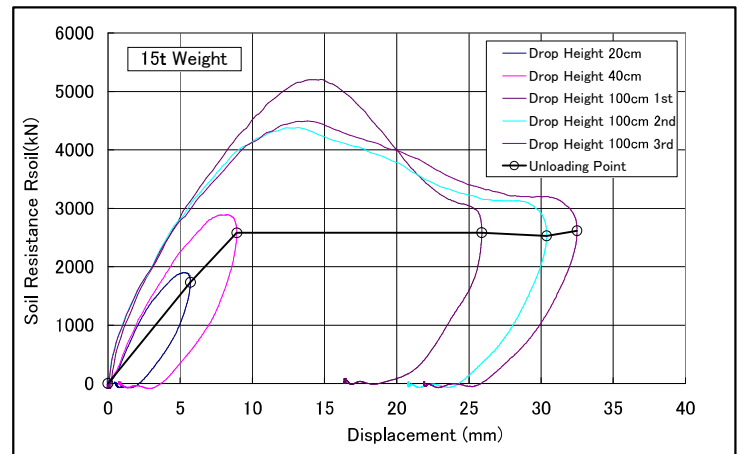
PSD Camera

PSD Displacement Measurement System

This PSD Displacement Measurement System is a high-performance displacement recognition device developed by our company. PSD (Position Sensitive Detector) is an optical sensor that can simultaneously detect the two-dimensional displacement of the position of a spot of light in the vertical and horizontal directions using a semiconductor position detection element. By combining this with the strain and acceleration measurement of the PDA (PILE DRIVING ANALYZER) manufactured by Pile Dynamics, Inc. in the United States, we have achieved high-precision measurement.

Rapid Load Testing Analysis

Rapid Load Testing (RLT) analysis is conducted using the unloading point method for each stage load applied in the multi-cycle test, and a static load-settlement curve is obtained by connecting the unloading points. Detailed analysis can also be performed using the CAPWAP waveform matching analysis program developed by PDI.



Unloading Point Method for Static Load-Settlement Curve

Achieving Rapid Load Testing up to 45 MN

Rapid Load Testing gained standardization in the Japanese Geotechnical Society in 2002, and the demand for this testing method has steadily increased ever since. To cater to this growing demand, our company offers a wide range of weight hammers, ranging from 2 to 70 tons. This enables us to apply rapid loads ranging from 1 MN to a maximum of 40 MN.

In numerous situations, conducting conventional static load testing proves challenging due to cost and reaction system constraints. Hybriddynamic Testing emerges as a compelling alternative, offering the advantages of rapid testing, reduced costs, and prompt delivery of test results. Consequently, Hybriddynamic Testing stands as a novel pile rapid load testing system that contributes to the rationalization and quality assurance of construction management at project sites.

Our expertise and extensive experience allow us to effectively address a diverse range of client needs.



15t System

2t System