Dynamic Load Testing with APPLE Systems

APPLE Load Testing Systems provide an attractive alternative to static load testing any type of deep foundation. These systems have modular ram weights ranging from 1 to 80 tons, and can be used for dynamic load testing or rapid load testing. In a dynamic load test application, APPLE Load Testing Systems can mobilize a capacity as large as 8000 tons. APPLE Load Testing Systems may be delivered to projects anywhere in the USA, Canada and Mexico.

APPLE Load Testing System

When a suitable ram is not available at the testing location, GRL chooses from its family of APPLE Load Testing Systems that can be configured for a wide range of weights. APPLE Load Testing Systems include a guide frame, a modular ram and a free release mechanism. A force transducer is typically placed on top of the foundation element to collect force measurements. Plywood is placed on top of the force transducer to cushion the impact. Velocity records are obtained from accelerometers attached near the top of the pile or shaft.

Benefits of Dynamic Load Testing with APPLE Systems

- Attractive alternative to static load testing
- Ram weights up to 80 tons available for dynamic load testing or rapid load testing
- Include a shaft or pile top force transducer to simplify force measurements
- Designed to activate a large range of test loads
- APPLE systems may be delivered to projects anywhere in the USA, Canada and Mexico

GRL Engineers, Inc.

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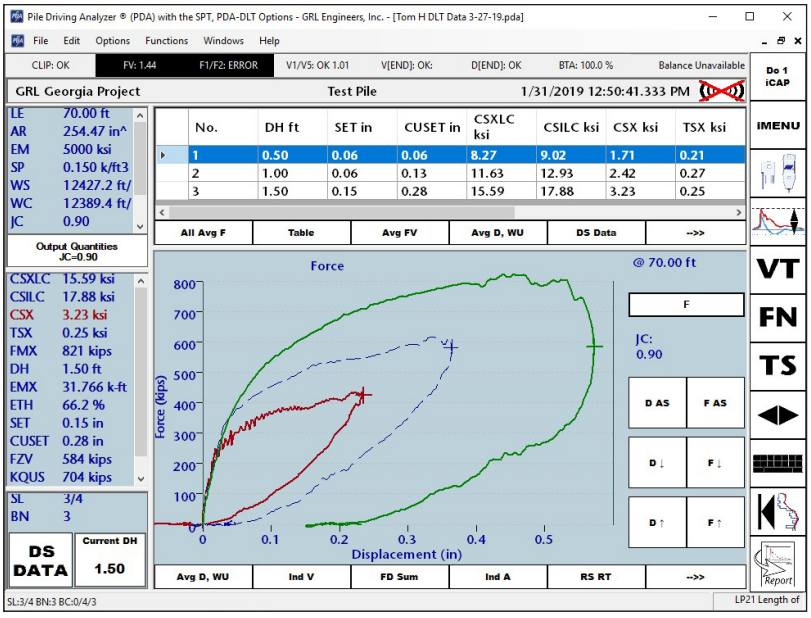
GRL Engineers, Inc.

APPLE Dynamic Load Testing Systems

GRL Engineers can provide an APPLE Dynamic Load Testing System for a wide range foundation types and loads.

APPLE Systems	Modular Weights (ram)
APPLE I	7 & 15 tons
APPLE II	4 to 20 tons
APPLE III	7 & 15 tons
APPLE IV	4 to 40 tons
APPLE V	8 to 16 tons
APPLE V 2G	8 to 20 tons
APPLE VI	4.5 ton ram
APPLE VII	1 ton ram
APPLE VII 2G	1 to 2 tons
APPLE VIII	4 to 80 tons
APPLE IX	4 to 24 tons



Dynamic Load Test Results of Drilled Shaft

APPLE Test Preparation

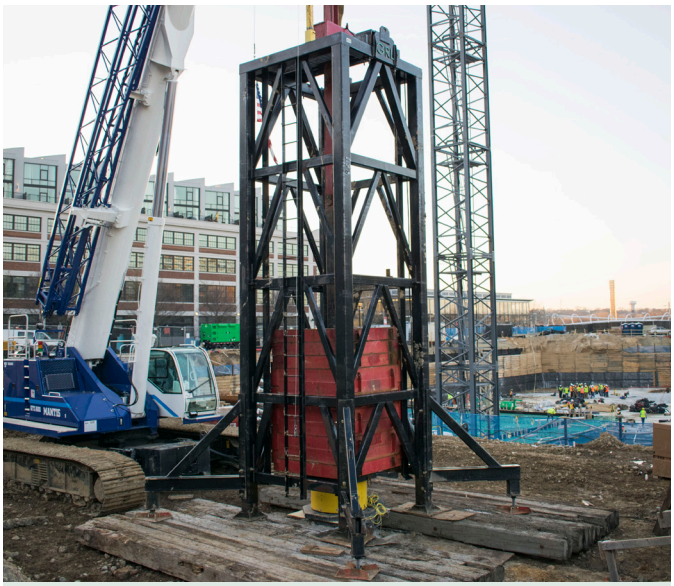
A contractor assembles the APPLE in a relatively short period of time, and can easily move it from one foundation to another. The APPLE guide frame not only facilitates a well-aligned ram impact, but also serves to support the ram weight prior to impact. In this way, the crane is not subjected to a sudden load release. The guide frame is positioned over the foundation and evenly supported on the ground.

Test Procedure

The ram is raised to the initial drop height selected by the GRL engineer. A hydraulic clamp first transfers the load to the frame and then releases it, causing a free ram fall. The ram impacts the top of the foundation. The applied force from the APPLE ram impacting the deep foundation element is determined from either a pile or shaft top force transducer or from strain gages bolted to the side of the deep foundation. The use of a force transducer often speeds up the testing process and generally provides more accurate force measurements. In a similar manner, the pile or shaft top velocity is determined from accelerometers bolted to the side of the deep foundation. GRL reviews the Dynamic Load Testing data as it is processed in real time with the Pile Driving Analyzer® (PDA). Based on the collected data, the test is repeated at additional drop heights.

Data Analysis and Reporting

Dynamic Load Testing data is further analyzed with the CAPWAP® software to determine the mobilized capacity and the predicted load-movement response of the deep foundation. The dynamic load test results are presented in a summary report prepared for the project.



ASTM Standard

Apple Load Testing Systems can be used for Dynamic Load Testing or Rapid Load Testing in general accordance with ASTM D4945 or ASTM D7383, respectively.

For additional information on Dynamic Load Testing with APPLE Systems or any other GRL Engineers service please contact info@GRLengineers.com or visit us at www.GRLengineers.com.

GRL Engineers, Inc.