Foundation & Geotechnical Engineering, LLC
"Specializing in Deep Foundation Engineering"

New Rapid Load Test

FGE is proud to offer a new line of rapid load testing, simply called the *RLT*, capable of up to 400 tons. The innovative *RLT* system makes use of a patent pending load pack that converts drop energy into a long-duration load pulse and thereby availing simplified kinematic data reduction methods[1].

Fig. 1 shows results of three consecutive load cycles on a shallow footing. Note load duration exceeds 100 msec making it ideal for present data analysis methods.

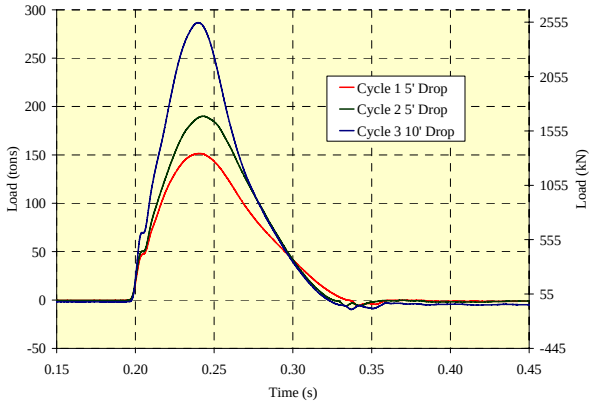

Figure 1 Long-duration RLT Load Pulses

The development of this device has been funded solely by FGE who contracted the University of South Florida to aid in development of key components and conduct independent verification testing.

Components

The *RLT* system has three main components which include: the load pack, a drop weight (mass) and a suspension/guide tower.

Load Pack. The loading assembly, which is mounted directly to the top of the foundation, is comprised of a specially designed attenuator assembly and a series of load cells for redundant measurements. The pack design is modular allowing for future larger load ranges. The present system is suitable for 100 to 400 ton loads, with future systems approaching 2000 tons.

Drop Mass. The mass assembly is modular providing for optimal shipping and cost effectiveness and in its current configuration can weigh as much as 14 tons. Specialized *RLT* software is used to determine the most appropriate mass configurations prior to shipping.

Guide Tower. The tower is used to support the mass at a desired height, as well as guide the mass during the test. It is equipped with a hydraulically actuated quick-release that safely drops the mass at the desired time.

Operation

Essentially, the test is conducted by suspending the mass from the tower above the loading assembly at a desired height, then releasing the mass by the use of a quick release and allowing it to impact the loading assembly. Upon impact the attenuator assembly is engaged and it transmits the force to the foundation through calibrated load cells in a controlled and relatively prolonged manner producing a load pulse, rather than an impact. The rebound hysteretic response of the attenuator assembly is very efficient at absorbing the energy resulting in drastically reduced subsequent drop heights (Fig. 2).

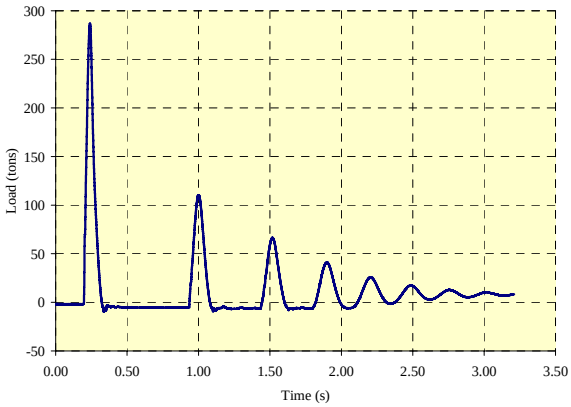

Figure 2 Load Pulse Attenuation

Regression

Well-known data analysis methods directly apply to *RLT* data thereby producing equivalent static test results (Fig. 3).

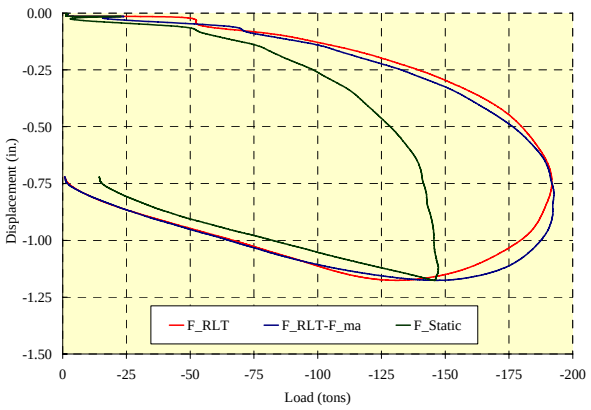

Figure 3 Unloading Point Method Analysis[1]

[1] Mullins, G., Lewis, C., and Justason, M., (2002). "Advancements in Statnamic Data Regression Techniques," *Deep Foundations 2002: An International Perspective on Theory, Design, Construction, and Performance*, ASCE Geo Institute, GSP No.116, Vol II, pp. 915-930.