



Information gathered by the engineers of
Goble Rausche Likins and Associates, Inc. and *Pile Dynamics, Inc.*

It is that time of the year again

We thank our clients and readers for another good year of working together and we hope that 2001 will bring you peace, health, success and delight.

NEWTON'S APPLE FALLS IN AMHERST

by Frank Rausche and Brent Robinson

GRL has designed and built a new dynamic loading system for drilled shaft capacity testing. The ram is modular and its weight can be varied between 5 and 20 tons. With these ram weights, and utilizing free release drop heights of up to 9 ft (2.7 m), we can generate ultimate test loads of up to 2000 tons.

The guide frame, designed and constructed in cooperation with Fritz Koltermann of the Foundation Equipment Corporation in Dover, Ohio, has a 1.8 x 1.8 m footprint and a height of 6 m. After the ram is lifted by the crane to its top position, a pin is



Bill Maxwell of Hub Foundation operates Newton's Apple

own Pile Driving Analyzer® to acquire test data. Jim Maxwell of Hub Foundation in Harvard, Massachusetts operated our dynamic loading apparatus.

GRL has called its loading system "Newton's Apple" because it is really smart; it is instrumented for a precise reading of pile top force. This reduces pile excavations for strain sensor attachment and also is more accurate than the calculation of force from strain when the concrete quality is questionable. Comparison measurements between measured ram force and the force computed from pile strain measurement yielded very close agreement.

GRL's Newton's Apple has also tested piles in Tennessee and currently is testing in Houston for Berkel & Co. Contractors, Inc. Their test pile sizes vary between 350 and 450 mm diameter and have lengths up to 25 m. Proof loads of up to 400 tons have been generated with the 7.5 ton ram.

SHAFT INTEGRITY TESTS IN AMHERST

For research purposes, the shafts at the Amherst site were prepared with a variety of defects. GRL used its new Cross-Hole Analyzer™ (CHA), manufactured by Pile Dynamics (see overleaf) to locate these artificial defects. Furthermore, we used the Pile Integrity Tester™ by Pile Dynamics to conduct tests according to the Pulse Echo Method, also called the Low Strain Method.



GRL's Brent Robinson conducts a CHA test in Amherst

inserted through the ram lifting bar into the guide frame to transfer the ram weight to the frame. Of course, the weight can also be dropped directly from the crane, if the crane boom can take the whip.

On September 6, 2000, GRL conducted a series of tests at the National Geotechnical Experimentation Site at the University of Massachusetts in Amherst with a 7.5 ton ram. A 25 ton hydraulic crane helped to assemble and move the loading system from shaft to shaft. We unloaded the system from the truck, tested 3 shafts of 900 mm diameter and 17 m length and reloaded the truck, all within 7 hours.

GRL performed this demonstration together with Carl Ealy from the Office of Research and Development of the Federal Highway Administration. Carl actively participated and used his

GRLWEAP NEWS

GRLWEAP 2001 is now in an extensive testing phase with emphasis on user friendliness. We are also doing a major update on our hammer data file and have submitted data request forms to hammer manufacturers and representatives. We hope to release this new software in the second quarter of 2001.

Please visit our improved web site at www.pile.com