



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 1999, the end of the millennium will bring you peace, success and confidence in the future.



THE PILE INSTALLATION RECORDER

by George Piscealko

The Pile Installation Recorder (PIR) has been developed both for driven piles (PIR-D) and augercast piles (PIR-A). When placed in the crane cabin, the PIR's display unit (photograph) provides the operator with crucial information to aid in optimal pile installation during pile driving, or drilling and grout placement.

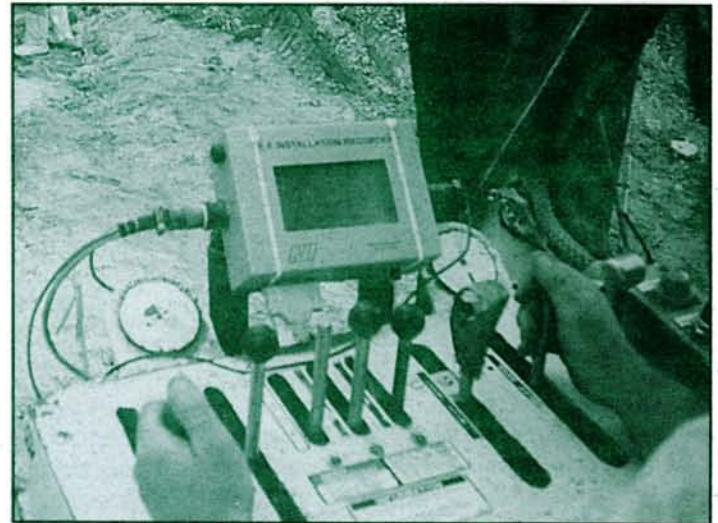
The PIR-D for driven piles records the number of blows and pile penetration with an accuracy exceeding that of an inspector counting blows. For diesel hammers, the ram stroke is also calculated and displayed. Optional measurements include impact velocity and pile inclination in two planes.

For augercast piles, the PIR-A records depth and pumped grout volume simultaneously. The grout volume pumped per unit depth is graphically displayed during installation to meet minimum grout ratios. If a problem is noted by the operator, the pile can then be re-drilled and re-grouted while the grout is still fluid. The PIR-A also monitors grout line pressure and volume per pump stroke, displaying the actual and target withdrawal rates as a guide to the operator for maintaining a minimum grout ratio without wasted grout. The PIR-A gives the engineer or owner greater confidence in the final product which in turn helps the augercast contractors gain better acceptance for their product.

Examples of the PIR-A applications include:

- Prof. Mike O'Neill from the University of Houston conducted a demonstration for the Texas Department of Transportation. Nine shafts were installed by Berkel Co. at three test sites were monitored. These 18" piles varied in length from 30 ft to 50 ft. The PIR-A was operated by engineers from PDI. It was quickly demonstrated to the site supervisor that the PIR-A was far more accurate in determining auger position than the inspector's estimate. For the final seven piles, the site supervisor relied solely on the PIR-A's auger position for final depth determination.

- Grout Systems, Inc. used the PIR at the Alliant Health Systems Project in Louisville, KY where more than 500 piles were installed. These 18" diameter piles were 50 ft long. The 150-ton piles were statically load tested to 450 tons. The PIR-A was operated and monitored by Law Engineering.
- At the famous Central Artery site in Boston, MA, contractor Richard Goettle, Inc. used the PIR-A to monitor more than 200 augercast piles of 14" diameter and 50 ft length. Printed PIR-A records were the basis for pile acceptance by the city inspector.



- At the new Paul Brown stadium in Cincinnati, OH, Richard Goettle, Inc. is currently installing more than 6000 piles of 16" diameter and 70 ft average length. This PIR-A has been customized to give the crane operator an audible tone with each pump stroke. The crane operator stated that this feature has made the job of maintaining the proper auger extraction rate much easier.
- The Ohio Department of Transportation specified the use of PIR-D at the Fort Washington Way project near Cincinnati, Ohio. Three PIR-D systems are monitoring the installation of several thousand piles. The project includes the installation of 20 bridges and numerous retaining walls along I-71, the major North-South freeway in Ohio. The contractors, C.J. Mahan and S.E. Johnson, are driving 14" diameter steel pipe piles and H piles to depths ranging from 45 ft to 80 ft. Additional pile driving rigs will be employed, each one equipped with a PIR-D.

Within a few minutes of initial installation, the crane operators were comfortable with the operation of the PIR-D. A single inspector can now travel around the vast construction site and check the printed PIR-D records for pile acceptance.