

# REMOTE POSSIBILITIES

**F**ive years ago, Carl-John Gravare often would drive hundreds of miles to perform a job that took him only one hour to complete. A civil engineer who tests foundations for buildings and bridges,

Gravare might drive four hours from his office in Gothenberg in southwest Sweden, do a quick test at a construction site, then drive four hours back.

His testing equipment, the Pile Driving Analyzer manufactured by Warrensville Heights-based Pile Dynamics Inc., was highly efficient. But Gravare couldn't justify the travel time. So he called Pile Dynamics with an idea: Why not build a tester that can transmit its data via cellular phone?

Six months later, Gravare received the pilot version of a remote tester.

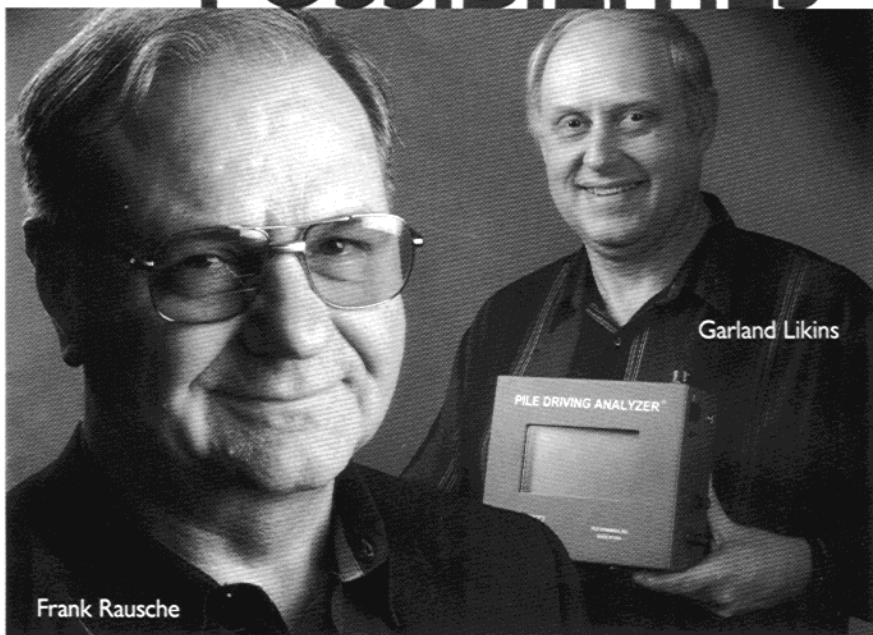
Today, Gravare can stay in his office and send the tester (model PAL-R) out with construction crews, who install motion sensors to the foundation and connect them to the PAL-R. Gravare controls the PAL-R's operation via his cell-phone connection to the construction site. Windows-based software in his office computer uses signals from the PAL-R to calculate pile capacity and quality.

This all gives him a competitive edge, because he doesn't bill for travel time anymore. "We get more work from all over Sweden," Gravare says. To keep up, two of his competitors have also bought Pile Dynamics remotes.

"When one of your best clients makes a very reasonable suggestion that you see would result in a benefit, you really should be listening," says Pile Dynamics president Garland Likins.

Likins and two other engineers from Case Western Reserve University founded Pile Dynamics 30 years ago after inventing a more efficient foundation tester. Until Likins, G.G. Goble and Frank Rausche came along, engineers could only test foundations by loading heavier and heavier weights on them (known as "static" testing). Such tests lasted days.

In the 1960s, the three invented the Pile Driving Analyzer, which tests a foundation only once while the pile driver packs it down. Sensors record the



Frank Rausche

Garland Likins

**Pile Dynamics' latest foundation tester helps engineers and construction crews save time and money.**

by Erick Trickey

effects of the pile driver's impact, and a computer uses the data to measure the pile's strength.

Today, construction engineers worldwide use a mix of the "dynamic" tests the company pioneered and traditional static tests. Pile Dynamics has sold about 750 dynamic testers since its inception and controls 90 percent of the worldwide market in them, Likins estimates.

Likins and Rausche still run the 25-employee company (Goble is retired). Their second business, the engineering consulting firm Goble Rausche Likins and Associates, uses Pile Dynamics equipment on construction projects across the United States.

In his consulting work, Likins experienced a foundation tester's grueling travel schedule firsthand. So when Gravare suggested creating a remote tester, Pile Dynamics — which had debuted the PAL, a small, portable tester, a few years earlier — put its engineers to work. Their biggest challenge was to transmit data via the "primitive" cell phones of five years ago, including unfamiliar overseas phone systems, says Pile Dynamics engineer Paul Brinkerhoff.

Without digital connections, the engineers had to convert test results

from digital to analog to digital again without introducing mistakes. To make the remotes workable everywhere, the company recruited its foreign customers to try out early versions of the invention.

In 1999, Pile Dynamics took the PAL-R to market. PAL sales have quadrupled from 1998 to last year. The introduction of the remote tester spurred most of the growth, Likins says.

Pile Dynamics hopes to persuade more American engineers to upgrade to the remote tester. Many still say, "I need to be there, need to see what's happened," says Brinkerhoff. But Likins fully expects the remote's efficiency to get their attention.

Overseas customers, who account for about half of the company's sales, rave about the tester. "It's saved me a lot of driving around and flying around," says Jon Cannon, a foundation tester in Melbourne, Australia. Cannon used to take many long, dangerous road trips through the outback.

These days, Cannon stays in Melbourne half the week but takes on more work. "Today, I was doing testing in Perth, while I'm actually in Melbourne" — 1,500 miles away.