

Site Link™



Pile Dynamics, Inc.

# Imagine

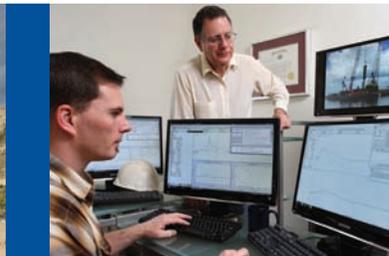
Bridge foundations completed

Safely. Quickly. Under Budget.



Site Link™

# SiteLink™ Technology



## The Future of Deep Foundation Testing is already here

Your bridge project is finally funded and ready to go. But your budget is tight, and so is your schedule. You need to have the foundations load tested *quickly and inexpensively* so your project can move forward. Dynamic Foundation Testing with SiteLink is the answer.

### What is SiteLink?

SiteLink is technology that enables engineers to conduct Dynamic Foundation Testing from wherever they may be.

### Why SiteLink?

SiteLink offers a high tech solution to shrinking budgets and fast track construction. It eliminates scheduling conflicts and the travel of an engineer to the field to conduct the test, minimizing the time until report submittal. The engineer monitors the job remotely, using software that tracks and controls the pile test.

### When Dynamic Foundation Testing is done with SiteLink Technology:

A Pile Driving Analyzer® (PDA) Model PAX with all necessary instrumentation is sent to the field; it's there when you need it.

The construction crew is trained to set up the instrumentation and initiate SiteLink.

A highly qualified PDA engineer performs the entire test from any location, in real time, exactly as if present on the job.

## The SiteLink Advantage

### Faster Testing

- Optimal scheduling
- No waiting to test a pile with unexpected blow count or penetration

### Lower Cost

- No unproductive time on the job for engineer or job crew
- No travel time or cost for the engineer

### More Tests Per Job

- More favorable factors of safety (LRFD\*)
- Quick assessment of variable soil conditions

### Faster Decisions

### Uncompromised Testing Quality

**Foundation Testing  
on demand anytime  
– a phone call away**

\*The AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications requires that foundations be designed for a Required Nominal Resistance that has to exceed the Factored Load divided by a Resistance Factor. Resistance Factors vary with the capacity verification method (static or dynamic test, wave equation or dynamic formula). LRFD allows for higher Resistance Factors when the number of pile tests is increased, thus allowing a more economical foundation design. Testing 100% of piles dynamically obtains the same favorable resistance factor as static testing in the AASHTO 2010 code.

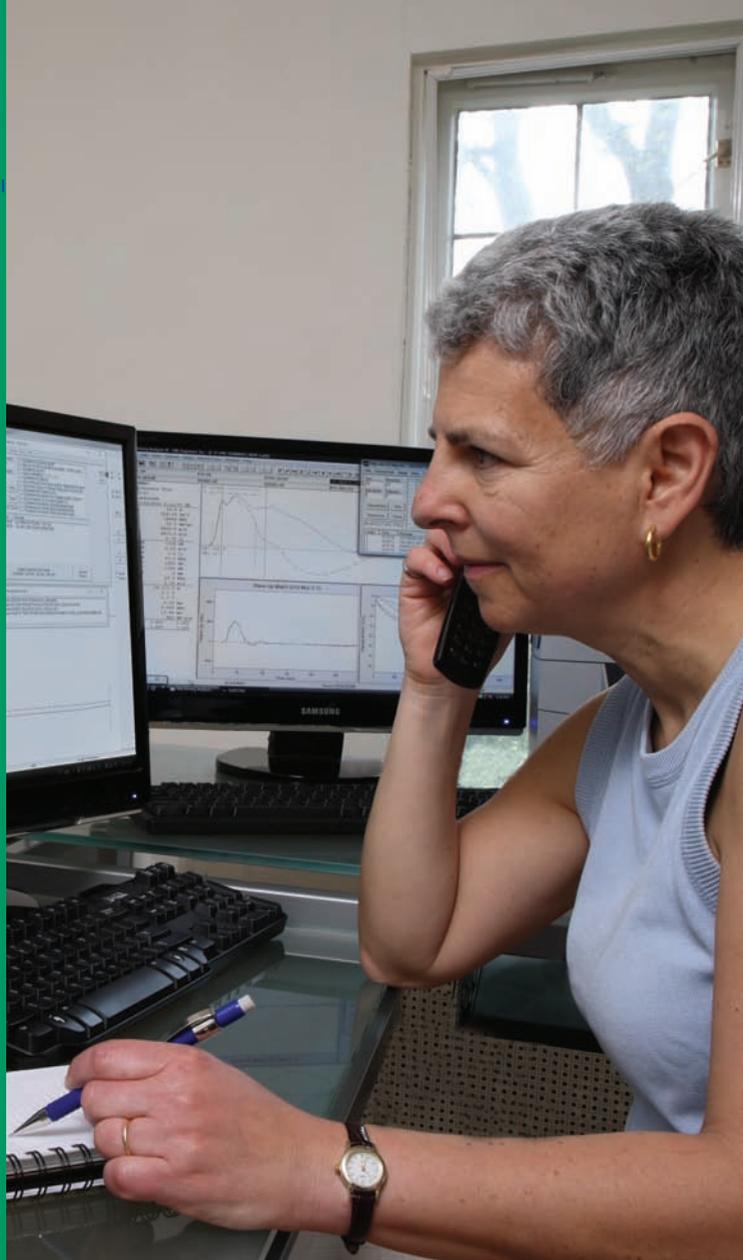


## Proven

### SiteLink™ Technology in Sweden

*In Sweden, SiteLink Technology has been in use since the year 2000. Today, most Dynamic Foundation Tests performed in Sweden employ the technology. A team of just four engineers is able to monitor thirteen Pile Driving Analyzers® dispersed throughout Sweden.*

*Read more about the Swedish, Australian and British experience in "Likins et al. March, 2009. Advances in Dynamic Foundation Testing Technology. Contemporary Topics in Deep Foundations." Available at [www.pile.com/references](http://www.pile.com/references)*



## Pile Driving Monitoring with SiteLink

**Capacity at the time of Testing (Case Method and iCAP™)**

**Driving Hammer Performance –**  
fundamental for construction control

**Driving Stresses –**  
essential for safe pile installation

**Pile Integrity**

During pre-construction test programs, Pile Driving Monitoring with SiteLink speeds up the formulation of a driving criterion. Production piles are started sooner.

During production, piles are driven according to the established criterion. An engineer monitors selected piles with SiteLink technology. If problems develop, the engineer immediately detects them and instructs the crew to stop driving.

iCAP calculates capacity at the time of testing through a signal matching procedure performed during Pile Driving Monitoring. Because it is based on CAPWAP® logic, it is a step beyond capacity determined by the Case Method. With no user interaction, iCAP extracts the soil behavior from dynamic measurements, computes capacity at the time of test, and produces a simulated static load test graph in real time.



## Dynamic Load Testing with SiteLink™ for any type of deep foundation

Dynamic Load Testing with SiteLink requires only a few hammer or drop weight blows on the foundation. It's fast, reliable and cost effective and assesses foundation bearing capacity of driven or non-driven piles. With the engineer already at a computer, CAPWAP® signal matching, an essential part of a Dynamic Load Test, often can be completed within a fraction of an hour of the impact loading.

### Results:

Foundation Bearing Capacity

Structural Integrity Assessment

Resistance Distribution

Engineers testing with SiteLink usually communicate with a project inspector via cellular phone. An on screen message exchange application, part of the SiteLink PDA-W software, is another option. A separate webcam could also provide a live feed during testing.

## A SiteLink Dynamic Foundation Testing Primer

A PDA model PAX with sensors and wireless transmitters is sent to the field. Field personnel attach sensors and transmitters to the pile while it is on the ground, prior to lifting. There are no cables between pile and PAX. No one climbs the leads to attach sensors.

Once the PAX is switched on, it detects the presence of the sensors. As the pile is driven, the sensors collect acceleration and strain signals and transmit them to the PAX. This data is

necessary and sufficient to estimate capacity at the time of the test (by Case Method and iCAP™), driving stresses, hammer performance, and pile integrity.

Soil resistance often changes following pile installation. For this reason, testing engineers estimate Bearing Capacity from Dynamic Load Tests conducted during re-strike testing. Engineers then evaluate Dynamic Load Test data with the CAPWAP® program. CAPWAP results correlate very well with

capacities determined by Static Load Tests.

Dynamic Foundation Testing theory is well documented in the geotechnical engineering literature, and accepted throughout the world. Dynamic Foundation Testing with SiteLink conforms to *ASTM D4945 Standard Test Method for High-Strain Dynamic Testing of Piles*, and does not compromise the quality or any other aspect of the test.



# Frequently Asked Questions



## **Does my organization need to purchase a Pile Driving Analyzer® (PDA) to take advantage of SiteLink™ Technology?**

You can certainly purchase a PDA model PAX, but you may also rent it from Pile Dynamics and contract with a qualified PDA testing company to provide the dynamic testing service.

## **How qualified are the engineers who perform Dynamic Foundation Tests with SiteLink?**

It is advisable to request that the engineer conducting the test has passed the Foundation QA High Strain Dynamic Pile Testing Examination, an independent and internationally recognized standard of quality, at the "Advanced" level or higher.

## **Will the field crews be trained?**

Many pile driving crews are skilled on how to attach PDA sensors. Those field crews that are not can be quickly trained; clear instructions are delivered with the Pile Driving Analyzer. In case a sensor is poorly attached, the monitoring engineer can easily detect the problem and instruct the crew on corrective action.