



## CAPWAP® Signal Matching Software

The necessary and sufficient analysis software for Dynamic Pile Load Testing

### Analytical. Measured. Trusted.

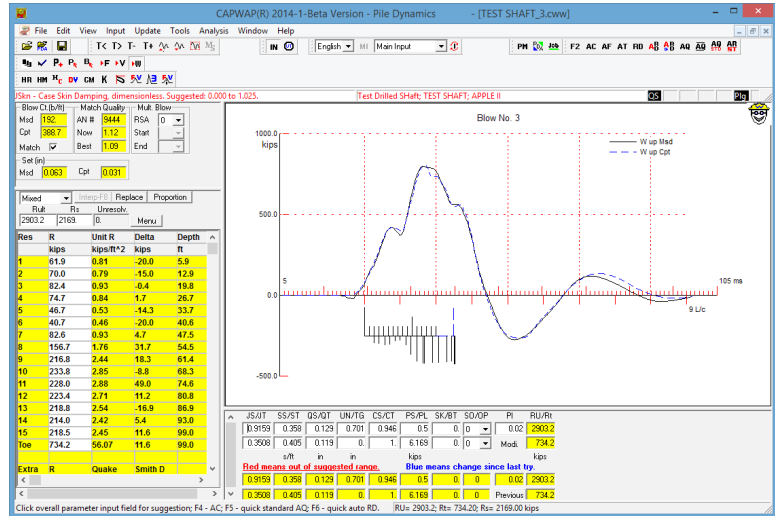
Forces and velocities occurring at the pile top during ram impact are complementary quantities related to each other by pile characteristics and soil resistance. CAPWAP (Case Pile Wave Analysis Program) is a signal matching software program that uses such force and velocity data measured by the Pile Driving Analyzer® system (PDA) to:

- Calculate static soil resistance magnitude and distribution along the shaft and at the pile toe
- Calculate stresses at any point along the pile
- Simulate a static load test in compression and tension (uplift)
- Predict the instantaneous load displacement behavior of the tested pile

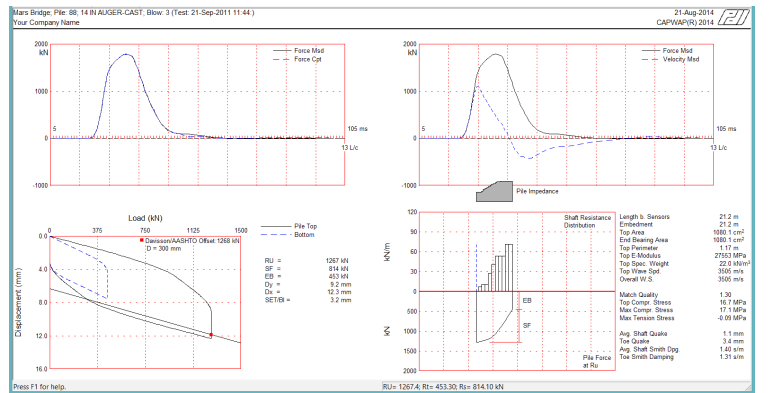
CAPWAP analyzes not only data obtained during PDA testing of driven piles, but also of drilled shafts or bored piles and augercast-in-place or continuous flight augerpiles.

### CAPWAP output includes:

- Simulated static load vs. pile top and toe movement
- Soil resistance distribution
- Dynamic forces and stresses along the shaft
- Damping and quake along shaft and at toe
- Measured and computed forces and velocities
- Maxima of displacement, velocity and transferred energy along the pile
- CASE Method results
- Optionally residual forces in pile and soil
- Comprehensive report including soil profile and driving log



CAPWAP Input Screen with Wave-Up Match



CAPWAP Standard Output Summary

### CAPWAP offers special tools to analyze Cast-in-Situ and Other Concrete Piles:

- Variation of wave speed over time
- Calculation and display of modified pile models, concrete volume, mechanical properties and wave speed
- Automatic pile impedance adjustment

## CAPWAP® Pile & Soil Model

CAPWAP models the pile as a series of continuous uniform sections (characteristics model) and the soil based on a greatly expanded Smith approach. Pile damping, splices, non-uniformities and multiple pile or shaft materials may be represented. The soil resistance is typically lumped into individual resistance forces at 1 or 2 m intervals with elasto-plastic static, linearly viscous and mass related dynamic properties. Radiation damping is represented by an additional mass and dashpot. It is also possible to model up to two additional toes, useful for certain non-uniform piles or to approximate a hyperbolic toe resistance behavior. Other options include Residual Stress Analysis for end of drive situations and Multiple Blow Analysis to analyze restrike tests.

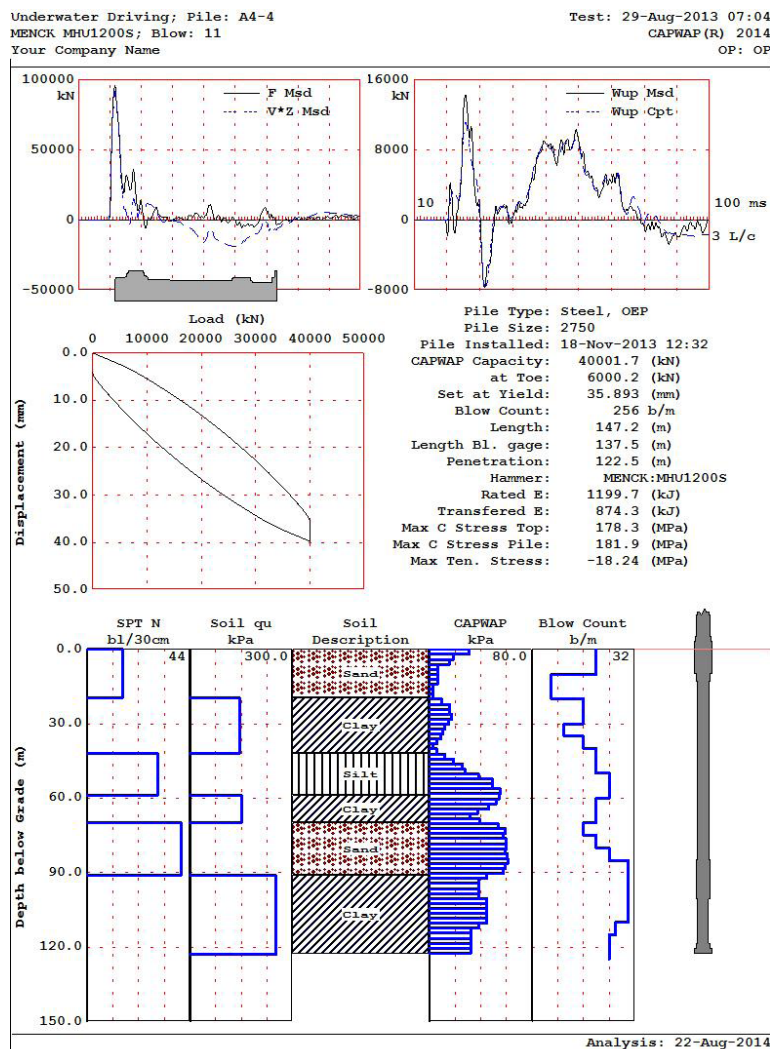
## CAPWAP Help Features

CAPWAP helps the user during input with a variety of variables that affect the signal matching process.

- Convenient input data quality checks
- Automatic signal matching options
- Comprehensive automatic matching procedures based on expert logics:
  - AC- Auto CAPWAP
  - Built in iCAP® routine
- Special signal matching procedures for related groups of parameters:
  - Dynamic soil resistance characteristics
  - Resistance distribution
  - Toe parameters
  - Static resistance - damping exchange
  - Shaft and toe resistance exchange
  - Options for automatic pile impedance adjustment for uncertain non-uniform pile properties
- Options to help input composite and non-uniform piles such as concrete filled pipe and tapered piles
- For cast-in-situ piles, automatic calculation of area of each pile model segment based on a s-built concrete volume vs depth data
- Extensive expert help system
- Warning indicators for unusual or uncommon parameter selections

The background manual completely covers theory, models and recommended procedures. A training class helps prepare the software novice. Continuing technical support from Pile Dynamics is available to all registered users.

Pile Dynamics, Inc. (PDI) is the world leader in developing, manufacturing and supplying state of the art QA/QC products and systems for the deep foundations industry. The company is headquartered in Cleveland, Ohio, USA, with offices and representatives worldwide. For additional information visit us at [www.pile.com](http://www.pile.com) or contact [info@pile.com](mailto:info@pile.com) today.



- CAPWAP finds the static soil resistance model that best matches the dynamic measurements of pile force and velocity, either automatically or interactively
- Calculations can be performed in Traditional US, SI or Metric units
- CAPWAP licenses are available with hardware or software locks
- CAPWAP is to be operated by a person with an engineering degree from an institution of higher learning with additional preparation by Pile Dynamics or its representatives