

BULLETIN

News from *SubTerra, Inc.*®

Wards Cove, Lake Union Hydrophonic Monitoring During Pile Driving Seattle, Washington

SubTerra, Inc. provided services to Waterfront Construction as the Vibration Consultant for this in-water pile driving project at Lake Union, Seattle, Washington.

As the project(s) Vibration Consultant *SubTerra, Inc.* was responsible for:

1. Preparing the project submittal for pile drive monitoring.
2. Conducting hydrophonic monitoring during pile installation.
3. Preparing compliance reports.



This photograph shows the crane mounted vibratory hammer installing a dock piling.

Three galvanized steel piles were driven with an ICE 14 vibratory pile driver to secure the main 200-foot dock. A high sensitivity hydrophone was used to measure peak water-borne pressures generated by the activity. An Instantel MiniMate was used to record waveforms at a sample rate of 65,536 Hz and a

BlastMate was used to record in histogram mode at 4096 Hz.

Before work began, two background noise readings were taken. The first represented no activity in the immediate area and the second measured a small boat with a 4-stroke outboard motor almost directly above the hydrophone sensor. Recorded in water dynamic pressures were 0.15 and 3.9 kPa respectively.

Readings were taken at depths from 5 to 20 ft at distances from 5-ft to 100-ft from the pile being driven. Readings ranged from 5.3 kPa at 5-ft to 4 kPa at 50-ft and 3.9 kPa at 100-ft.



This photograph shows the ICE Vibratory Hammer and power pack located on the dock.