

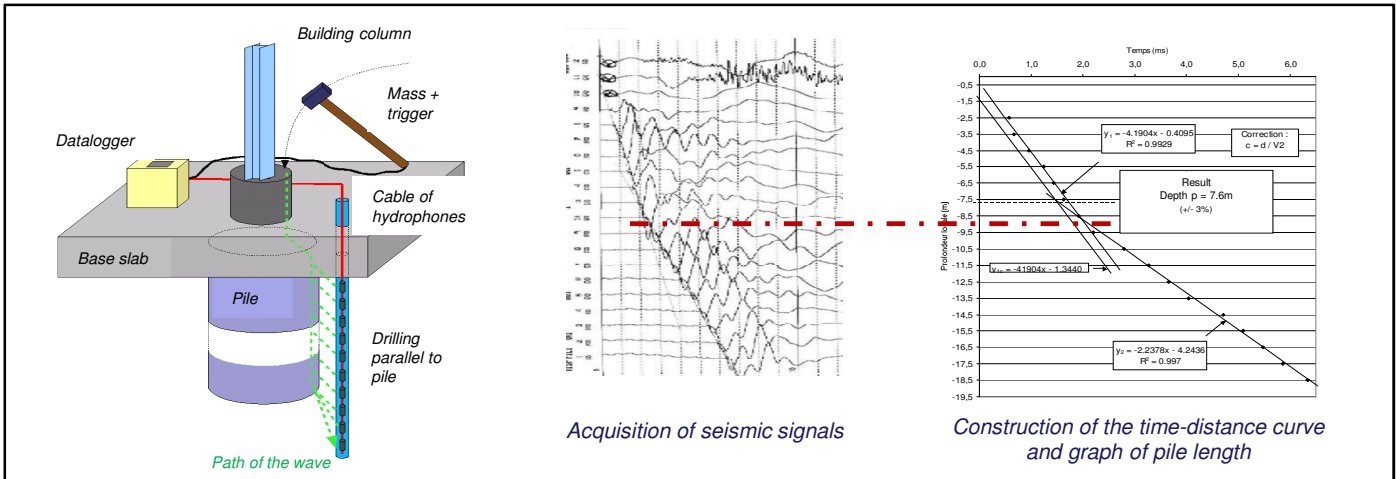


# PARALLEL SEISMIC



**SOLDATA**  
GEOPHYSIC

French Standard P94-160-3



The parallel seismic method is an active method in which measurements are performed in a borehole drilled near a pile or a foundation wall. It provides information about the continuity, integrity and length of these foundation elements.

Applications

- Control of foundations (length, integrity or continuity of piles and rigid inclusions, etc.)
- Calculation of Jet Grouting column length



The method uses the properties of propagation in a homogeneous medium. A series of evenly spaced sensors (hydrophones) are placed in the borehole, filled with water, located within 1m from the foundation. A shock is delivered at the head of the foundation by a hammer. This pulse induces several shock waves that propagate, from the pile foundation wall or floor, to the ground

Classic data treatment involves constructing a graph representing the first arrival times as a function of the depth of the sensors. Generally a curve is obtained showing two different slopes: one corresponding to the speed in the pile, and the other to the speed in the supporting ground.

Interpretation of the graph enables a characterisation of the pile in terms of depth, continuity (presence of anomalies in the curve) and integrity (wave velocity in concrete).

In addition, further analysis (waveform, frequency content) may allow the detection of possible anomalies in the foundation.



**Legend**

1.Principles of implementation and interpretation  
2.& 3. Measuring equipment and implementation

**Key figures**

- Measurements from PVC sealed cased borehole (diameter 52 mm) or from a piezometer  
- Distance between drilling and control tube:  $\leq 1$  m approx.

- Depth of investigation: up to 80m  
- Length of foundation provided within 5%

**SDG Equipment**

- Cable of hydrophones (12 sensors) or tri-directional geophone sensor  
- Seismic laboratory or spectrum analyser