

Passion for Progress



Bauer Spezialtiefbau

IT measurement

Low-strain integrity testing

Contact

Technical Services

Phone: +49 8252 97-1303

BST-BT-SEK@bauer.de

BAUER Spezialtiefbau GmbH

BAUER-Strasse 1

86529 Schrobenhausen

Germany

Phone: +49 8252 97-0

www.bauer.de



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Description

Low-strain integrity testing (also known as the impact echo or TNO method) involves the introduction of a pulse into the pile head by means of a hammer blow. The results can be analysed to detect cross-sectional changes, defects and deviations from the theoretical length. The method can also be used to obtain information on the usability of piles (inadequate concrete quality) in cases of doubt. As such, this method also serves as a quality management tool. Testing under load is possible. Yet, no indication can be gained of the pile's load-bearing capacity.

Measuring principle

The test is performed using a conventional hand-held hammer and a measuring device with an acceleration sensor. A pulse is introduced into the cured, cut-back pile head and the reflections recorded at characteristic points in the pile. For evaluation and analysis purposes, the processed data is usually displayed and interpreted in the form of a speed/time graph.

Measured data

The pile can then be allocated to one of five classes based on the EA-Piles 2012 (Chapt. 12.3, 2nd edition) rating system:

- A1: Pile OK
- A2: No restriction of working load detectable
- A3: The pile exhibits a slight quality impairment
- B: The pile is not OK; severe quality impairment
- 0: Unable to analyze signal

A portable measuring device (collector) shows individual or averaged signals directly on the LCD display. The recorded measurement signals can be transferred to a PC for analysis by suitable software. The method is ideally suited for use on in-situ concrete piles in non-cohesive soils with a diameter-to-length ratio not exceeding 1:30.

