



Low Strain Pile Integrity Test

Introduction

Low-strain Pile Integrity Testing (PIT) is a valuable, low-cost tool to locate major defects in, and estimate pile lengths of, bored and driven piles installed on site. It can serve to enhance the confidence level of the engineer on the quality of piles installed ⁽¹⁾. The test has been carried out by the Pulse-Echo (or Sonic Echo) Method, in accordance with the guidelines given in applicable IS ⁽²⁾, IRC ⁽²⁾ and ASTM ⁽⁴⁾ Codes.

PIT is a Non-Destructive integrity test method for foundation piles. The Collector-model Pile Integrity Tester (PIT Collector) is a precision instrument and analysis system for pile shaft integrity testing by low-strain surface-impact methods (*alternatively called Sonic Testing, Pulse Echo, or Transient Response*).



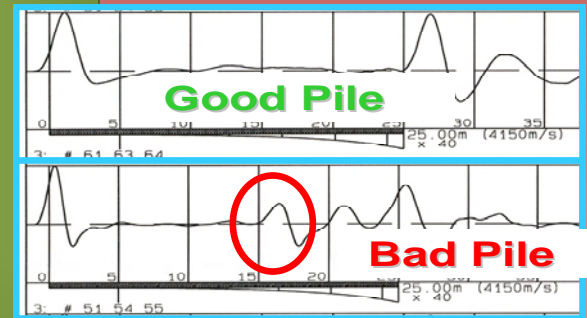
PIT may be used for any concrete pile (e.g. augercast piles, drilled shafts, driven concrete piles, concrete filled pipes). It detects potentially dangerous defects such as major cracks, necking, soil inclusions or voids and, in some situations, can determine unknown lengths of existing piles or test piles supporting existing bridges or towers.

Test Procedure

- The pile top surface is prepared in order to form a clean, sound and hard concrete for testing. Care must be taken to ensure that the concrete at the time of testing has attained designed strength.
- The accelerometer is fixed to the top of the pile using a special wax.
- A small impact is administered to the pile's surface, using a special hand-held hammer.
- The accelerometer signal is evaluated in the field or transferred to a personal computer for further analysis using PIT-W software.



Data Collector



Typical PIT Results

(1) Sorabh Gupta, Ravi Sundaram & Sanjay Gupta, (2008), "Pile Integrity Testing for Monitoring Pile Construction", Geosymposium 2008, Indian Geotechnical Society Delhi Chapter, pp 173-178.

(2) IS:14893: 2001, "Non-Destructive Integrity Testing of Piles (NDT)- Guidelines".

(3) IRC:78-2000, Notification No. 54 dated 28th May 2009, Appendix-7 (Part-2), "Standard Test Method for Low Strain Pile Integrity Testing".

(4) ASTM D5882-00. "Standard Test Method for Low Strain Integrity Testing of Piles"