

Static and dynamic load tests comparison considering load-energy level and soil non-linearity

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ABSTRACT: This paper presents the results obtained from dynamic and static load tests performed in cast-in-place piles. The test piles have 22 m of length and 0.60 m of diameter, constructed in a sandy soil using a recoverable steel casing. Three piles were tested: i) two by dynamic load test ii) and the other companion pile by static load test.

The dynamic load tests followed a procedure with two stages. Initially, a set of impacts with increasing falling height was applied. Afterwards the energy was kept constant for the maximum falling height. The records from the dynamic load tests were interpreted using CASE and CAPWAP analyses. The soil-pile parameters obtained from CAPWAP analyses were used to simulate static soil-pile response. Soil non-linearity was considered by applying a stiffness reduction factor.

The static load test was performed using a hydraulic jack against a structure supported by four reaction piles. The load distribution was measured at the top and at 12 different levels of strain gauges. A load cell was installed at the pile tip.

The results obtained from these load tests are compared and discussed taking into account the load-energy level and soil non-linearity.