

A.1 Statnamic

The Statnamic Load Test (STN) has been developed by TNO and Bermingham Foundation Equipment. The principle of the test is based on the launching of a reaction mass by burning fuel in a closed pressure chamber. This reaction mass is only 5% of the weight needed for a static load test. Loading is perfectly axial.

Figure A1-1 represents the successive stages of a Statnamic load test. Phase I is the situation just before launching. A cylinder with pressure chamber has been connected to the pile head and the reaction mass has been placed over the piston. In phase II the solid fuel propellant is ignited inside the pressure chamber, generating high-pressure gases and accelerating the reaction mass. At this stage the actual loading of the pile takes place, as an equal and opposite reaction force gently loads the pile. The applied pile force, displacement and acceleration are directly monitored. The upward movement of the reaction mass results in space, which is filled by the gravel (phase III). Gravity causes the gravel to flow over the pile head as a layer, catching the reaction mass and transferring impact forces to the subsoil (phase IV).

Available device loads are 1, 2, 3, 4, 5, 8, 16, 20, 30, and 40 MN. The testing range is between 25% and 100% of the device load. Devices of 100MN are under design and will be manufactured..

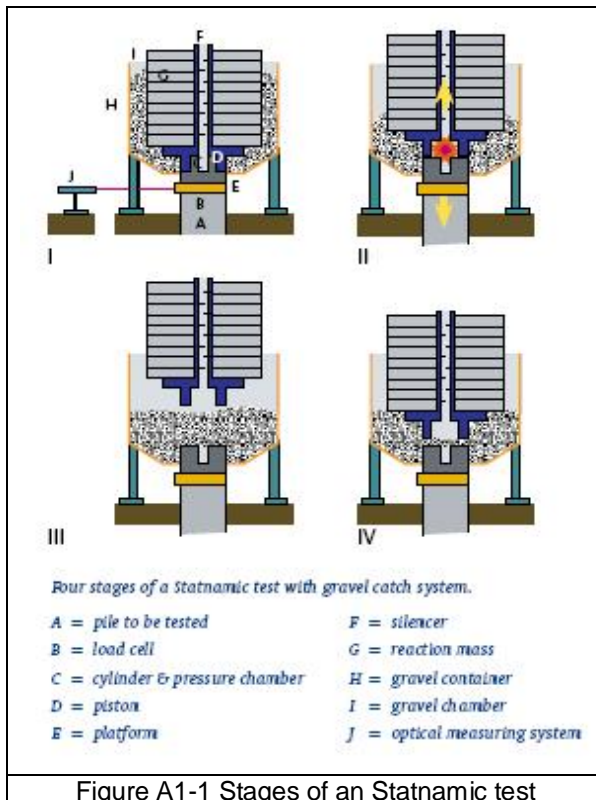


Figure A1-1 Stages of an Statnamic test

During the test the reaction mass reaches a height between 2-3 m and then falls back. For high loads of 5-30 MN, gravel is used to catch the reaction mass. For loads in the range of 1-8 MN, a hydraulic catching system is utilized to arrest the reaction mass. With the latter system a considerable shorter cycle time is achieved, enabling more tests per day. With a 4 MN hydraulic catching device, 3-4 piles can be tested per day.

Reference

Middendorp, P. ; Bermingham, P. ; Kuiper, B.
 Statnamic load testing of foundation piles.
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 Rotterdam, Balkema, 1992, pp. 581-588