

The Loadtest automated incremental loading test

LOADTEST provides expert independent service in the field of Maintained Load Testing both for top-down application of load and for bi-directional testing using O-Cell technology. This information sheet deals specifically with top-load application for static load testing.

The monitoring and quality of static load tests has been significantly enhanced in terms of safety, reliability and accuracy of the results by the automation of:

1. measurement and recording of pile settlement and applied loading
2. control of the applied load
3. controlled change of load subject to preset criteria

Each system consists of load and displacement sensors, a microprocessor based data logger/controller, and a hydraulically operated device for application of load. The equipment is capable of measuring and recording the load automatically during a test at pre-set intervals of typically 1 minute, to a resolution of 1 kN and pile deflection to 0.01 mm respectively.

The system automatically checks for continued safe operation every 2.5 seconds, making any appropriate corrections to the hydraulic pressure in the jack to maintain the load to within very tight tolerances. The equipment is powered by a rechargeable battery and is designed to be easily transportable. A computer can be used to monitor the load and deflection rate for immediate analysis, either locally or remotely, without interrupting the test.

The data may be presented on screen in tabular and graphical forms and printed results can be readily obtained, making reporting easy and fast. Over 3000 computer controlled loads tests have been carried out using this patented system. (U.K. Patent No. 2323174)



Figure 1. A 12MN Reaction system

Subject to accurate and sufficient static load test results, such as those provided by the automated equipment, the displacement/time data can be modelled to project to the final settlement at each load and the significant pile/soil characteristics for a specific site, together with elastic shortening, developed skin friction and end bearing capacity.

Advantages of automation

Using computers, all actions of load application and recording can be carried out according to any normal specification. Progress of the test can be supervised remotely and with minimal site attendance thereby overcoming the frequent requirement of staff remaining on site during the night. Additionally, the computer equipment is programmed to take appropriate action in the event of a range of potential anomalies ensuring progress of the test is paused safely awaiting engineering attendance/assessment. These improvements represent an important advance in site safety.

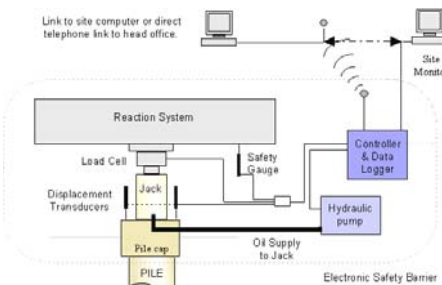


Figure 2. – Diagrammatic illustration of the typical testing arrangement

A separate displacement sensor is used to monitor the movement of the pile head with respect to the underside of the reaction beam. This allows a secondary measurement of pile head movement and load applied as well as necessary verification of the integrity of the reaction system.

It will be widely appreciated that the quality of load testing is of paramount importance and that inferior methods can lead to incorrect conclusions being drawn. The top-down load testing service can be provided for occasions where a client may already have a reaction system or the service can be complemented with a range of reaction systems applicable to loads up to 12MN.

Several different configurations of reactions systems are readily available from 1.2MN to 12MN. A few examples are included here.

Illustrated in Figure 1 is a 12MN arrangement, which can be placed on anchors on a 4x4 arrangement for maximum capacity or at a reduced maximum test load capacity can be used with 4 anchors placed symmetrically within a 7x7 grid.

Ready Assembled Reactions test systems

These reaction systems provide safe and rapid assembly to anchor piles for the load testing of foundations.

Anchor piles, suitable located and reinforced can be pre-prepared with steel connection points for the erection of the reaction frame.

Added safety is achieved by minimising the number of connections between the reaction system and the anchor piles and ensuring that they are at a level that is easily accessible from the ground.

The 2MN arrangements can be connected to 2, 4 or 6 anchors arranged on a 4x1.5m and 5m spacing.



Figure 3. - 2MN CRAFT set up on 6 anchors with 6 Dywidag bars

Compatible with a 4 anchor arrangement set on a 4x1.5m spacing, the 4MN systems are a very compact reaction solution.



Figure 4. – 4MN CRAFT set up on 4 anchors with 4 Dywidag bars

The 5.5MN arrangement requires 4 anchors arranged on a 4x1.5m or 4x2.5m. The spacing of the secondary beams can be increased to 5m but with a reduction in maximum capacity.



Figure 5. – 5.5MN CRAFT set up on 4 anchors with 8 Dywidag bars

LOADTEST: Providing Confidence in Foundations through Load Testing around the World.

www.loadtest.com