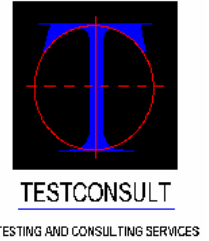


STRUCTURES DATA SHEET 14

Load Testing



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Buildings and Structures

Undertaking full scale Load testing of building components or elements is the definitive method of proving the structures capability to carry a load or complying with either Building Regulations or British Standards. Load Testing is particularly useful if other means of theoretical analysis are not possible or practical.

Testing falls into two main categories: Routine Verification or Change of Use

A variety of loading techniques are available including water weights, steel kentledge, reaction frames or simple hydraulic jacks – the choice of loading regime will be governed by the test requirements, the site logistics and access.

- Examples of Routine Verification are as follows:
- Lift Beam tests
- Holding Down Bolt – Pull-out Tests
- Balustrade Testing
- Christmas lighting fixings

When there is a change in use of a building or a building element shows suspect performance, then testing will be required to establish performance; examples of change of use could be refurbishment of Victorian warehousing to residential use, the addition of an extra level to an office block or re assignment of storage for heavy items.

Deflection of elements is undertaken electronically using displacement transducers or draw string potentiometers. These instruments are connected up to a remote data logging system away from the loading activities such that any failure during the tests will not endanger the testing team.

Theoretical analysis of deflection can be undertaken using STADD PRO Finite Element analysis of the structure. This will produce expected deflection in the components and induced stress levels.



Floor loading test using water dams



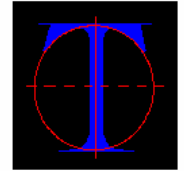
Controlled proof load test of beam in our lab

Complete knowledge of the structure and the strength of the materials used in the construction are necessary in order to produce an accurate model of the building element.

This FE analysis will however determine the anticipated behaviour under any proposed loading regime and is likely to indicate the optimum selection and position of instrumentation as well as providing the basis for appraisal of results. Careful planning is crucial if the test is to achieve a constructive solution.

STRUCTURES DATA SHEET 14

Load Testing



TESTCONSULT

TESTING AND CONSULTING SERVICES

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Testing of crowd control barriers and inspection of sports grounds

Crush Barriers and other structures play an essential part in crowd control and safety at Sports Stadia. Stringent testing and inspection is therefore essential to ensure that their performance satisfies the Home Office requirements.

Guidelines for testing and inspection are given in the Guide to Safety at Sports Grounds, Fourth edition published by HMSO in 1997 and Institute of Structural Engineers – Dynamic Testing of Grandstands and Seating Decks. These documents give details the test and performance requirements. Additional requirements are given in BS6180:1982, Code of Practice for protective barriers in and about buildings.

Twenty five percent of all crush barriers, handrails and perimeter walls are required to be tested annually, with different barriers tested each year over a four year cycle.

Testconsult provide a testing service which is in strict accordance with the Home Office and Institution of Structural Engineers' procedures and accuracy requirements. Testing is conducted by qualified personnel with experience in this field, using electronic load measuring cells and high precision dial gauges to monitor deflection. The work is carried out for the Club itself or for its professional adviser.

