

# Site Investigation

## Falling Weight Deflectometer (Prima 100)

The Falling or Light Weight Deflectometer has a number of applications. In many situations it can be used to replace static load testing such as the plate bearing test and in situ CBR. It can be used as an aid to design and as a monitoring device to check compaction and thickness of hydraulically bound materials.

### Dynamic Stiffness Test

As the FWD measures the dynamic stiffness modulus it is most suitable for dynamic loading on roads, car parks and machinery installations. The standard configuration is a 300mm diameter plate with a 5kg weight. Smaller plates can be used and the weight can be increased which means that the equipment can also be used in pavement core holes (250mm diameter) using a 200mm plate, and stiffer materials can be tested by reducing the plate size and increasing the drop weight.

### Road Construction

Modern road designs can be made using appropriate values of stiffness modulus for the various layers. Even if empirical methods have been used, suitable values can be set. In the past the correct installation of fill materials, capping, sub base and hydraulically bound bases has been dependent on ensuring proper compaction of materials with the correct grading and moisture content. Measuring these parameters is not usually instant and, even with a correctly calibrated nuclear density gauge, variations in moisture and gradings can cause problems, particularly with recycled aggregates.

### Instant Values

Using the FWD it is possible to obtain instant values of the dynamic stiffness modulus which directly relates to the design and the performance of the underlying layers. In this way it is relatively easy to ensure sound construction.

### Design Guidance

The FWD is now called up in the current version of the Highways Agency Design Guidance for Road Pavement Foundations (IAN73/06 Draft HD25/06) under the performance designs section. It is also referred to in TRL Report 611, 'A guide to the use and specification of cold recycled materials for the maintenance of road pavements', as a means of end product testing and in the WRAP publication 'A design and specification guide for Scotland's road authorities to facilitate the use of recycled and secondary aggregates'.

### Industrial Flooring

The equipment's dynamic nature makes it ideal for testing base structures before concrete or asphalt paving in industrial buildings to ensure that the design criteria has been met.



### **Excavations**

It is notoriously difficult to ensure proper compaction in trenches whether they are utility trenches or for structural maintenance purposes. The FWD provides a direct reading of the dynamic modulus and, being readily portable, can be used in almost any situation.

### **Temporary Road and Piling Platforms**

Often the integrity of this type of road is essential to prevent serious expense. The speed with which the FWD can be used means that much more comprehensive grid area can be tested than would be possible with static plate bearing or CBR tests.

**The Falling Weight Deflectometer is ideal for obtaining stiffness parameters at shallow depths. It is an in situ technique that is particularly useful for fast, non-invasive, non-destructive testing of sub base and sub grade materials.**