

## LWD-1 Lightweight Deflectometer



### Applications

The LWD-1 can be used for:

- Roadway Construction: subgrade, subbase and road base compaction QA
- Airport Runways
- Railroad Track Bed Compaction Testing
- Overlot Fill Grading and Parking Lots
- Earth Retaining Walls
- Earthen Dams
- System conforms to ASTM E2835-11 for plate deflection measurement due to an impulse load.



### Introduction

The Lightweight Deflectometer (LWD) is used to test pavement system, soils and prepared earth for stiffness.

Olson Instruments Light Weight Deflectometer will allow for the measurement of in-situ soil modulus, confirming compaction.

Designed specifically to collect the most appropriate data and remove uncertainty about impact force it incorporates several additional benefits into its form factor.

Olson's design is unique in the market, it will measure the actual impact force with a dual sensor system to calculate stiffness and modulus based upon soil type.

The LWD has also been used as a replacement or supplement for nuclear density gauge testing. The combination of the two being a very powerful tool for insitu compaction, and the LWD test alone a good pass fail QA check.

### Features

- Embedded load cell measures actual impact force to calculate stiffness (peak force ÷ peak displacement) and modulus based on soil type (granular, clay or mixed)
- Calibrated geophone receiver measures plate deflection
- Simple design embeds spring assembly inside falling weight, preventing noise of loose spring motion on sensors
- Multiple plate diameters available — 300, 200, 150 and 100 mm
- Two additional external geophones can be added to the system for deflection basin or Spectral Analysis of Surface Waves (SASW) layer moduli determination
- Durable stainless steel design
- Quick and easy on-site testing; can be performed with no special certification with immediate results
- Portable and lightweight - single person operation



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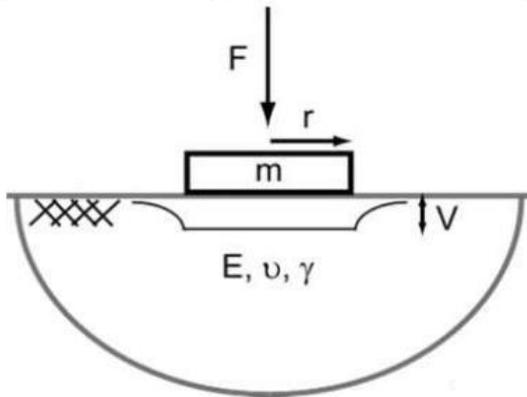
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## Light Weight Deflectometer Principal

A LWD measures the deflection caused when a dropped weight applied force to a bearing plate placed upon soil and pavement systems. The calculation of Young's Modulus relies upon solving for a load applied through a rigid circular plate onto an elastic material.



In practice the included WinLWD software is used to calculate stiffness and modulus from three sample drops taken after the machine is correctly seated in the test position.

## Sample results in WinLWD



**Force curve during impact**



**Deflection curve during impact**

**Avg. Soil Stiffness = 18.080 kip/in, Avg. Modulus = 1.188 ksi.**

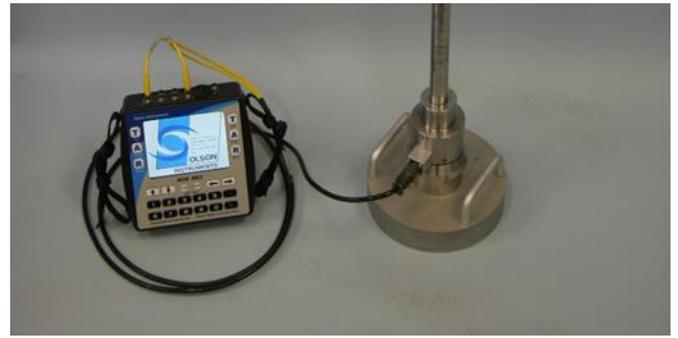
**Results, usually displayed above deflection curve**

## NDE 360

Olson Instruments NDE 360 is a multipurpose nondestructive evaluation platform, developed specifically for acoustic and seismic testing techniques.

The NDE 360 is used as the control and data logging system for the LWD but is compatible with a full range of testing techniques including SASW testing separately or combined with LWD and several tests for foundations.

Geophysical tests available include Crosshole / downhole seismic and Seismic reflection testing.



## Specifications

- 27 kg Total Unit Weight
- 9 kg Falling Weight
- 600 mm Drop Height
- 9 kN Impulse Loading
- 20 millisecond Impulse Duration
- Includes Olson Instruments four channel NDE 360™ Platform with touch screen and compact flash.

## About PCTE

PCTE have over 30 years experience in the measurement and testing of concrete. With experience in research, consulting and construction they are able to assist you in reviewing issues and developing solutions. PCTE can provide more than just the equipment. They can provide leading technical support for your business.

## Other Equipment

The full Proceq range of equipment is available for insitu non-destructive concrete measurement, including Schmidt Hammers, Covermeters, Half Potentials, Resistivity and Permeability. The Olson Instrument range includes the NDE360, CTG, Freedom Data PC and DAS as well as the resonance tester. We also supply Intelli-Rock maturity, temp and humidity logging systems, corrosion rate monitoring equipment, and Ground Penetrating Radar.