High-performance LPA (Longitudinal Profile Analyser)

LPA equipment measures the IRI (International Roughness Index) of the different layers that make up a road. The IRI is based on the response of a car to irregularities in the road profile. Based on road profile data, numerical methods are used to calculate the response of a “golden car" or quarter-car model travelling along that profile at 80 km per hour.

The LPA is made up basically of a vehicle that pulls a special trailer on which the actual measuring system is mounted..

The trailer contains the following elements:.

• A rigid arm with a motorcycle type feeler wheel measuring 2¼” x 8”..

• A ballasted chassis to keep the wheel in permanent contact with the road surface. .

• A support system between the ballasted chassis and the rigid arm comprising a spring and a shock absorber. .

• A low-frequency inertia pendulum fitted on the arm that provides a fixed reference point for measuring the relative movement of the arm with respect to the pendulum..

An LVDT type sensor measures the displacement between the pendulum and the arm, and produces a signal proportional to the angle between them. When the unit is travelling at a speed at which the irregularities in the longitudinal profile of the road fall within the frequency range of equipment, the signal from the LVDT is proportional to the profile..

The equipment is fitted with a control system and a computer system that handles data acquisition, processing and storage. The gap between consecutive measurements is 25 cm,

and data are acquired by means of a high-resolution analogue data acquisition card.