



EQUIPMENT

GROUND PENETRATING RADAR (GRP)

New solutions for your pavement assets

Ground Penetrating Radar (GPR) enables you to 'see' a clearer picture of what is happening beneath the surface - in essence, it is an x-ray of the road. In the pavement industry, GPR is widely used for locating utility lines, monitoring pavement and runways, locating reinforcement bars, changes in layer thicknesses and voids, as well as moisture determination. Key to its success in recent times is in determining construction layers thereby limiting the number of destructive boreholes needed.

Non Destructive Pavement Thickness Data Acquisition

Ground Penetrating Radar is a highly versatile non destructive method which provides a range of condition and construction information. It is an echo sounding method where a transducer (transmitter/receiver) is passed over the surface. The transmitter sends out low powered radio energy and reflections from material boundaries and embedded features such as metal or voids are picked up by the receiver. Sampling is so rapid that the collected data is effectively a continuous cross section, enabling rapid assessment of thickness and condition over large areas. GPR is effective on rough surfaces and through multi-layered media, but penetration and resolution are hampered when 'looking' through highly conductive materials such as wet clays and soils.

NON DESTRUCTIVE PAVEMENT THICKNESS EVALUATION

A Tool for Pavement Evaluation and Design

Non-destructive testing is gaining more and more popularity among pavement engineers. There are several non-destructive tools available for pavement evaluation which provide valuable information regarding the condition of the existing pavement structure.

The Falling Weight Deflectometer (FWD) for measuring deflection is a good example of these tools. However, the FWD data only provides information of the deflection bowl for the tested structure but not pavement profile. In order to determine the elastic modulus of materials, apart from the deflection data, the pavement profile of the tested structure is required.

The pavement profile information can be obtained in many ways such as local knowledge of the pavement construction history, as-built drawings and geotechnical investigations. Conventionally, the geotechnical investigation provides us the greatest confidence. However, it is a destructive test which engages boreholing or excavation. In addition, it can be costly and takes time due to mandatory Dial Before You Dig (DBYD) applications, thickness measurement, material characterisation, sampling for laboratory tests, traffic control etc. Furthermore, boreholes could be extracted from a section which is not representative of the pavement profile.

Considering the aspects discussed above, the Ground Penetrating Radar (GPR) techniques were introduced to determine a continuous pavement profile and material characteristics.

Ground Penetrating Radar (GPR) is a non-destructive test. By using GPR, the change of material throughout the pavement depth can be detected, essentially providing the thickness of each pavement material. The current technology also allows data to be recorded at traffic speeds in continuous measurements. This provides us a continuous pavement profile reading without ground disruption and traffic delays. By combining the GPR data and targeted boreholes investigation, the confidence of the pavement profile will be further improved.

Data Generated

PMS provides two levels of Construction Reports: Summary Construction & Detailed Construction.

Summary Construction reporting is designed to provide the Pavement Engineer with a broad picture of the subsurface enabling them to perform a series of actions based on knowledge rather than assumption. The Summary Construction format reports typical (not statistical) layer thickness values within construction segments, and acts as an additional tool for the Pavement Engineer to be used in conjunction with other survey data sets.



Detailed Construction reporting is designed to provide the Pavement Engineer with maximum level of information from a traffic speed survey. Unlike summary construction reporting, detailed construction provides you with statistical layer thicknesses, typically every half a meter.

Many clients choose to have this information reported graphically as longitudinal sections which provide an instant understanding of the underlying construction. Data may also be reported in tabular format. Detailed Construction reporting is an economic and efficient way to build an understanding of the construction of a road network or section.

