Multi-Depth Deflectometer System for Pavement Evaluation

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ABSTRACT

Researchers at the University of California, Davis have developed an advanced multi-depth deflectometer system designed to accurately measure deflection and deformation within pavement structures at multiple depths.

FULL DESCRIPTION

This technology provides a multi-depth deflectometer system comprising anchored assemblies installed within bore holes of pavement structures. It uses linear variable differential transformers with magnetic cores housed in multiple body assemblies to gather precise deflection and deformation data relative to a stable anchor rod. The system includes a snap connector assembly, target rod assemblies, and a surface cap for secure installation, enabling comprehensive real-time monitoring of pavement layer conditions across multiple depths, enhancing pavement diagnostics and maintenance planning.

APPLICATIONS

- Pavement health monitoring for roadway maintenance and asset management.
- Infrastructure quality control during road construction and rehabilitation.
- Research institutions conducting pavement material and performance studies.
- Government transportation departments and civil engineering firms.
- Smart city infrastructure monitoring and predictive maintenance systems.

FEATURES/BENEFITS

- Enables accurate, multi-depth measurement of pavement deflection and deformation.
- Reduces external interference by anchoring securely with an auger tip and spring-loaded isolation sleeve.
- Speeds assembly and disassembly through a modular design with snap connectors.
- Improves signal reliability by routing cables through the body assemblies for protected, consistent data transmission.
- Maintains alignment and mechanical stability by locking components with spring-loaded retaining fingers and compression springs.
- Enables post-installation maintenance by providing surface access ports that eliminate the need for excavation.
- Strengthens overall system integrity by forming uniform bore hole liners during installation.
- Eliminates inaccurate depth-specific readings by capturing pavement layer deformation at multiple depths with higher precision.
- Prevents sensor drift and misalignment by securing instrumentation against soil and environmental forces.
- Avoids excavation-based servicing by enabling access to measurement components after installation.
- Reduces installation and removal time by simplifying device setup and teardown.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

anchor rod assembly, borehole, deflection measurement, linear variable differential transformer, pavement evaluation, snap connector assembly, surface cap, target rod assembly, vibration sensing, wireless data transmission

CATEGORIZED AS

- **Engineering**
  - Engineering
  - Other

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