

Rii's Additional NDE Methods



Ground Penetrating Radar (GPR)

High Speed Tomography - GPR is a non-destructive inspection method that uses radio waves to penetrate into pavements, structures, sub-structures and other mediums. It provides information on pavement layer structure and bridge deck conditions. Rii uses this technology to determine:

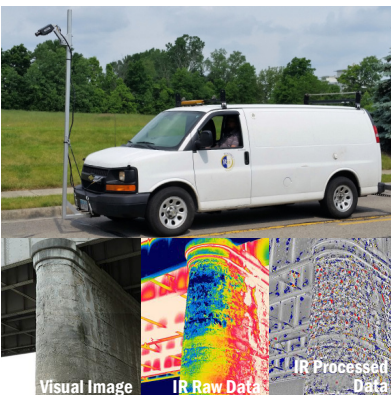
- Pavement thickness
- Pavement joint condition
- Unexpected air voids under concrete or asphalt pavement
- Asphalt density
- Bridge deck concrete condition
- Rebar spacing and depth
- Unknown utility locations



Falling Weight Deflectometer (FWD)

Rii owns a JILS-20HF FWD, a high force FWD mounted on a two-axle trailer designed specifically for determining structural information of any type of pavement. FWD data can be used to:

- Back-calculate elastic moduli of pavement layers
- Determine subgrade resilient modulus (M_R)
- Evaluate structural condition of the pavement
- Determine maintenance and/or rehabilitation needs of pavements



Infrared Thermography System

An Infrared/Visual System identifies and located delamination/debonding in concrete bridge decks. Rii's system is mounted on a moving vehicle to scan the deck at highway speed. Piers and other bridge concrete structures are also scanned from the ground or a boat. Rii uses the latest FLIR system, FLIR A6700sc Thermal imaging camera with FLIR cooled InSb detector, with the following features:

- Excellent image quality
- High sensitivity
- High speed image acquisition



Bridge Deck & Pavement Coring

Rii conducts bridge deck and pavement coring to:

- Provide additional information on pavement type and thickness
- Assist in pavement rehabilitation and design
- Confirm GPR results
- Help determine concrete condition through lab testing
- Provide additional information on rebar diameter and depth

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High Speed Profiler

Rii utilizes the Ames model 8300 High Speed Profiler to perform pavement smoothness testing and measure the International Roughness Index. This profiler model is designed as a portable system, and is front-mounted on a pick-up truck using a two-inch receiver hitch. Benefits of this technology include:

- Profile elevations can be collected at a speed range of 14-70 mph
- Graphical display of laser and profile data
- Easy step by step calibration procedures displayed on screen



Automated Dynamic Cone Penetrometer (ADCP)

Rii's ADCP system, manufactured by Vertek, is equipped with an automatic lift / drop mechanism and Windows-based Data Acquisition System (DAS), providing an accurate, fast and efficient test method for evaluating in-situ conditions of new and existing highway and airfield pavements, as well as quality control of new pavement construction. The ADCP-DAS determines in-situ strength and thickness of soils, unbound granular base and subbase layers and subgrades.



Zorn Light Weight Deflectometer (LWD)

Rii's Zorn LWD for Asphalts (ZFG 2000A) is designed to assess the stability of existing asphalt layers and to determine the hardness for broken and stable layers. Rii's use of LWD for asphalt ultimately reduces the cost of testing, increases the reliability of results, and produces high performance and low maintenance pavements.

Drone Technology



Rii has a portable and powerful drone for project site assistance. Drones offer unparalleled professional aerial imaging, allowing trained Rii professionals to better assess storm damage and provide the best solutions possible. Evaluating storm damage on the ground is only one perspective, an aerial view may open new insights and generate new ideas for rebuilding. Using a UAV drone, professionals are now able to perform infrared scans of buildings and structures, which will help to quickly identify sources of energy efficiencies, destructive water damage and structural issues.