Case Study - Concrete Pavement
Korean Accelerated Environmental Simulator, Expressway & Transportation Technology Institute, Korea
January, 2009
KALES (Korean Accelerated Environmental Simulator)

- Scientific evaluation of pavement response and performance
- Asia first real scale pavement accelerated environmental simulation laboratory
# KALES – Concrete Pavement Test Overview

## Aim
To evaluate the long-term behavior and performance of concrete pavement joint.

## Location
Expressway & Transportation Technology Institute, Korea

## System Integrator
MainTra Co., Ltd. (http://www.maintra.com)
Kyu-Wan Lee (maintra@paran.com)
Sung-Hoon Jung (maintra3@naver.com)

## Customer
Expressway & Transportation Technology Institute

## Date
January, 2009

## Instrumentation
1. Micron Optics sm130-700 Optical Sensing Interrogator (1,000 Hz sampling rate)

## Sensors
2. FBG embedded strain sensors (Lateral & longitudinal direction of pavement joint)

## FBG Benefit
Immunity to Electro-magnetic Interference (EMI) and high tolerance to fatigue.
Concrete Pavement – Sensor installation

• FBG sensor installation
  ✐ Embedded FBG strain sensors are coupled by optical connectors
  ✐ Connection points are wrapped by tape
  ✐ Armored patch cords are used to protect the cable during concrete pouring
  ✐ FBG sensors are mounted near dowel bars and frames using steel wire
Concrete Pavement – Measurement

sm130-700 FBG interrogator (1KHz)

Concrete pavement joint
(Embedded FBG strain sensors)

Armored patch cord
Concrete Pavement – Data Results

- Sample result
Results & Acknowledgements

• Results & Conclusion
  - The information was useful to the customer because of the higher accuracy and reliability results achieved as compared to those from conventional sensors.
  - The installation was single and intuitive.
  - The customer was very pleased with the results.

• Acknowledgements
  - Mr. Duk-Soo Sohn of Expressway & Transportation Technology Institute, Korea, (End customer)
  - Kyu-Wan Lee & Sung-Hoon Jung. (System integrator and on-site installer)
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