Case Study - Bridges

Composite Road Bridge SHM

M6 motorway, Lancashire UK, 2006-2007

Composite Road Bridge SHM

Aim	Monitoring of strain and temperature on the UK's first motorway bridge built from FRP deck sections. The SHM program will be used to obtain feedback on the design performance of the bridge.
Location	M6 motorway, Lancashire UK
System Integrator	Smart Fibres, Ltd
End Customer	Strainstall Ltd
Date	2006-2007
Instrumentation	(1) Micron Optics, sm125 Optical Sensing Interrogator (Smart Fibres, W4)
Sensors	Smart Fibres SmartPatch and SmartTemp
Software	Smart Fibres' SmartSoft
FBG Technology Benefit	High multiplexing allowing multiple sensors

Composite Road Bridge SHM

Composite motorway bridge

Composite Road Bridge SHM, Installation

Instrument cabinet housing sm125 (W4),alongside its solar panel power source.

Results and Acknowledgements

- Results
  - The bridge was monitored for a 12-month period by approximately 100 FBG strain and temperature sensors, along with conventional electrical strain gauges and laser leveling targets. Sensors were mounted on both the FRP deck sections and steel support beams. A solar powered sm125 (W4) interrogator permanently installed onsite allows continuous quasi-static monitoring and the client is able to see real-time data from the bridge using a GSM modem.
  - An FBG was selected as a trial of new sensor technology.
  - The customer found the information very useful as it verified the static and dynamic performance of the bridge and is planning to adopt the technology on further installations.

- Acknowledgements
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  - Smart Fibres Ltd.

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