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Laboratory and Field Comparison of Long-gauge Strain Sensing Technologies

Издательство DEStech Publications, Lancaster, 2010 год

6 стр; формат: 23,5 x 16 см; библиографический список: 3 единицы
ISBN: 978-1-60595-024-2

Strain is one of the most interesting parameters to be measured for the monitoring of civil and industrial structures. When the global behavior of the structure is of interest, it is important to select a sensor that integrates the strain measurement over a basis that is much larger than the size and distance of local defects in the construction material. For reinforced concrete structures, this means that a gauge length of ten times the aggregate size or ten times the average distance between cracks is recommended in order to obtain an average measurement of strain which is representative of the global behavior of the element under investigation.

Many different sensing techniques are available nowadays to measure long-gauge strain, each with advantages and limitation. This paper compares the performance of the most widely used techniques with regards to the precision, accuracy and thermal influence. The sensors were first tested in identical laboratory conditions and then installed side-by-side in a reinforced concrete bridge to evaluate their field performance under real conditions, in particular under the daily temperature variations.

Ключевые слова:

Содержание.

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