KUIC Technology Profile

Composite Material Systems for Use in Bridge Applications

Summary:
The invention is a composite system useful for indicating and preventing fatigue on essentially any metallic structure.

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Applications:

New and existing bridge structures.

Overview:

The composite system works as a surface treatment for existing structural elements. The system reduces stress levels at structural details so that the adverse effects of structural fatigue are substantially reduced. Additionally, the composite system provides a method of fatigue level indication at the given structural detail.

How it works:

The composite system is bonded to the prepared surfaces of structural members by a structural adhesive or is applied by spray application. As the structural member is exposed to fatigue loading, the system accepts a portion of the load. Because many details are particularly fatigued in bending, the added local structural thickness substantially improves stiffness, even though the material stiffness of the system may be considerably lower than the underlying material. If fatigue level is reached, the composite material will crack through and essentially unzip the surface of the structure, exposing an indicator. The indicator then alerts the engineers to the exact location and fatigue levels being encountered at a specific structural detail.

Patents: US 8,202,378; 8,343,294

Inventor(s): Ron Barrett-Gonzalez, Caroline Bennett, Stanley Rolfe, Adolfo Matamoros.

Tags: Construction

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