“Fatigue Analysis of Steel Bridge Details: Hot Spot Stress Approach”

The hot spot stress approach has been used successfully for welded details in various engineering fields, but prior application to bridge engineering has been limited. The existing nominal stress approach for fatigue evaluation of welded details in steel highway bridges is limited to empirical categories and is thus unable to deal with novel geometries. The nominal stress approach is limited in dealing with out-of-plane distortion fatigue, a common form of cracking in steel girder bridges. The hot spot stress approach provides an alternative that is more predictive in analysis and more reliable, as well as covering a wider range of geometries and loading modes.

This work develops a hot spot stress approach for fatigue design of steel bridges. The approach’s accuracy, safety, sensitivity to element mesh quality and density, and ease of application is evaluated. The hot spot stress approach facilitates the use of FEM in design, provides a method to quantify secondary distortion stresses, eliminates the need for a fatigue catalogue, and permits full analysis of industry’s latest configurations.

Tuesday, Feb. 16, 2010
JHU Homewood Campus
Computational Science and Engineering Building
CSEB Room B17
12:00 – 12:50 pm

Seminar is FREE. For parking please see link for visitors at www.jhu.edu and select information on Homewood Campus. For more information contact civil@jhu.edu.

One Professional Development Hour (PDH) will be awarded to attendees.