CEE691 Seminar Series in Spring 2017

The Department of Civil and Environmental Engineering
University of Hawaii at Manoa

Ductile Fracture of Mild Steel: Theory and Experiments

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Abstract Steel hull vessels and offshore structures may be subjected to deformations and damage due to collisions, grounding and other extreme loading conditions. To assess the survivability and residual strength of dented or deformed steel plating, a capability to predict fracture under general loading conditions is necessary. In an effort to provide reliable techniques for predicting ductile fracture, a research project was undertaken using combined experimental and numerical studies. A new ductile fracture theory has been developed based on critical surface energy release for crack formation. The presentation examines this theory in light of existing fracture criteria and finite element modeling. Results of a parallel experimental program are also presented in which measurements of strains on the surface of the steel plating are made to assess and verify candidate fracture criteria. The displacement and strain fields are measured using Digital Imagining Correlation (DIC). These experimental efforts include several uni-axial stretching and cylindrical indentation geometries.

Tuesday, February 28th
2:30 p.m. – 3:20 p.m.

Crawford Hall
Room 105

Building Select: Crawford Hall (Craw or CR)