

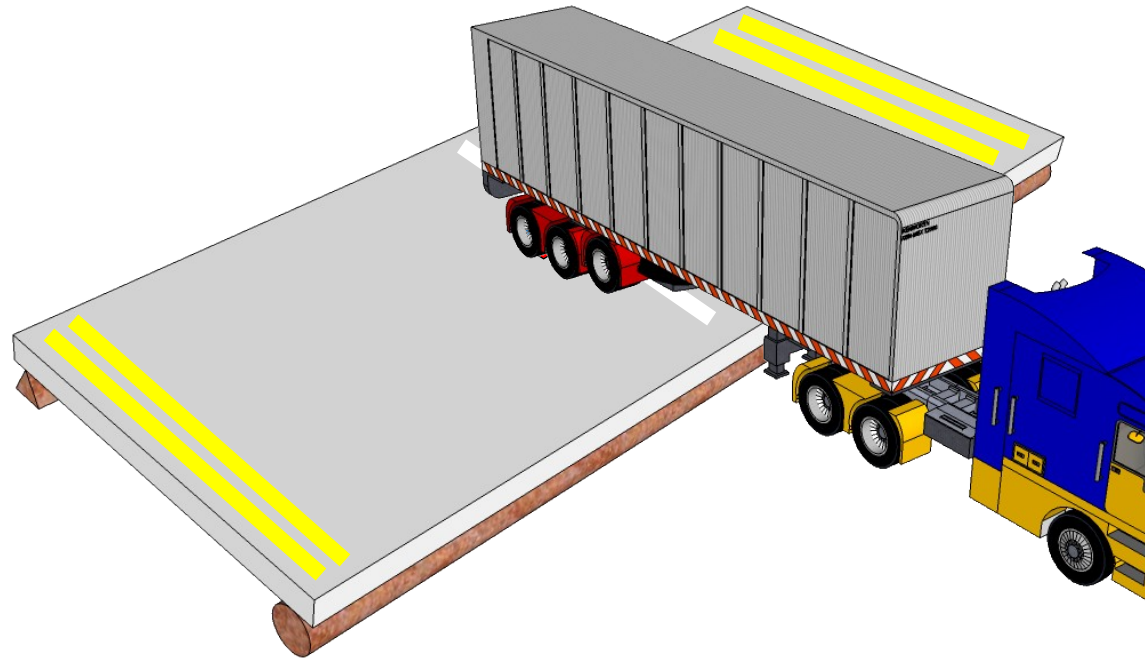
Combined lower and upper bound plastic analysis: *better than the sum of its parts*

International Bridge Forum

September 2009

Andrew Jackson / Dr Campbell Middleton

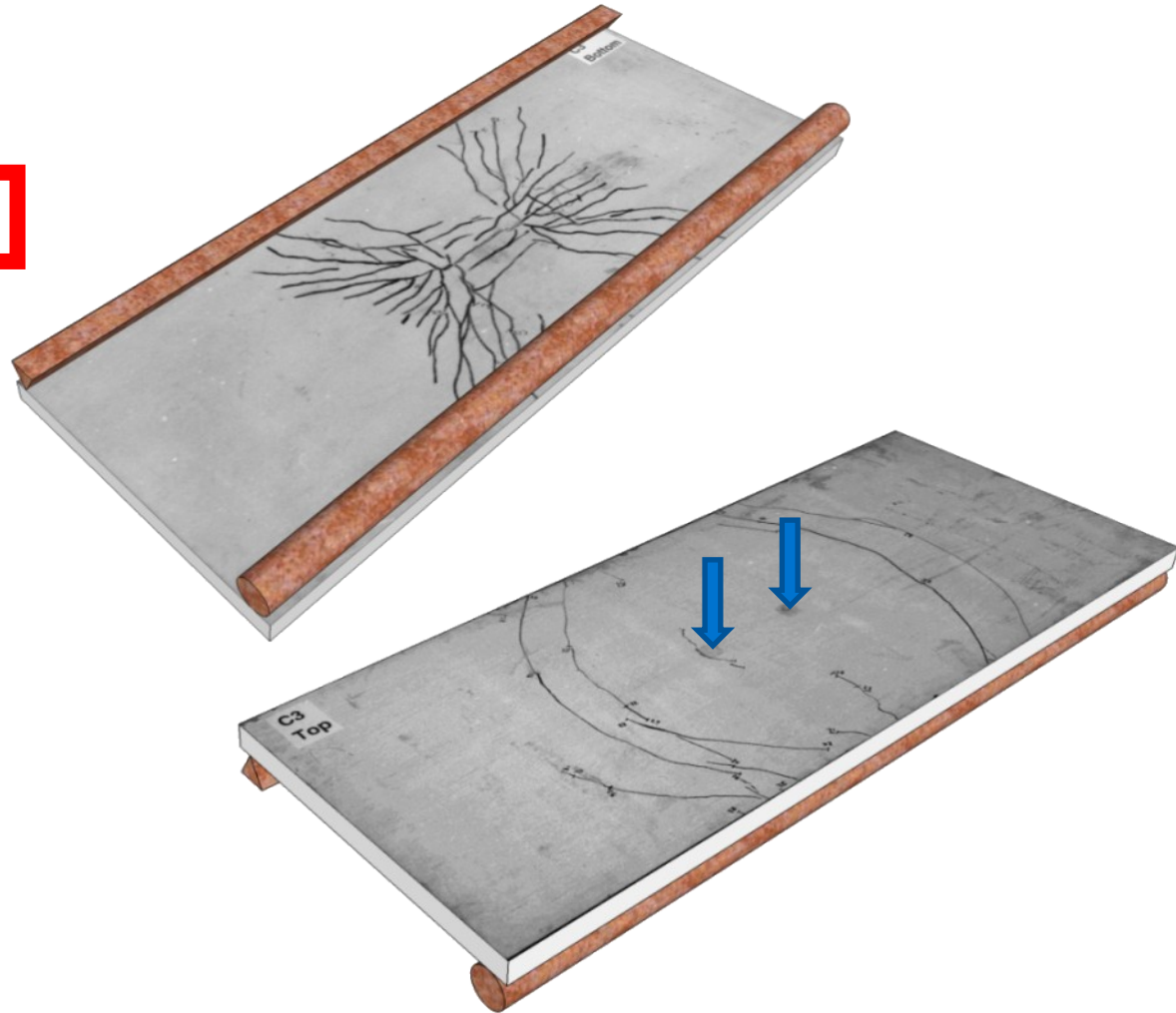
Bridge Slab



Bridge Slab: Load Test

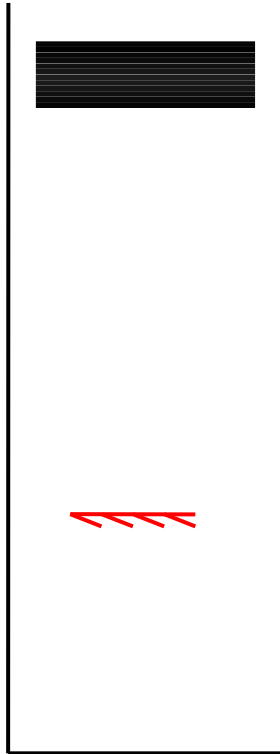
Collapse load

 Model test



Bridge Slab: Elastic Analysis

Collapse load



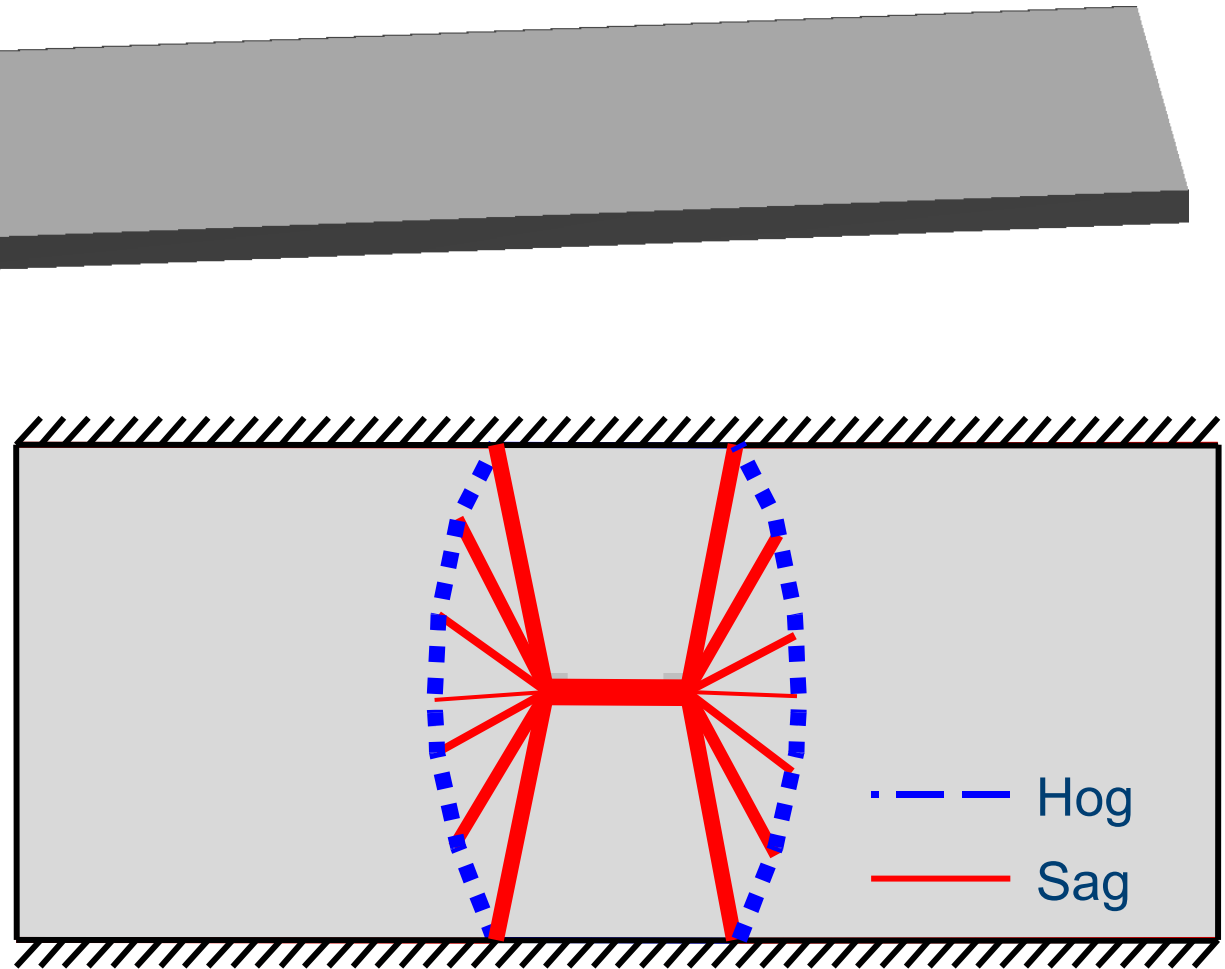
Elastic grillage
analysis

Bridge Slab: Yield Line Analysis

Collapse load



Plastic upper bound analysis

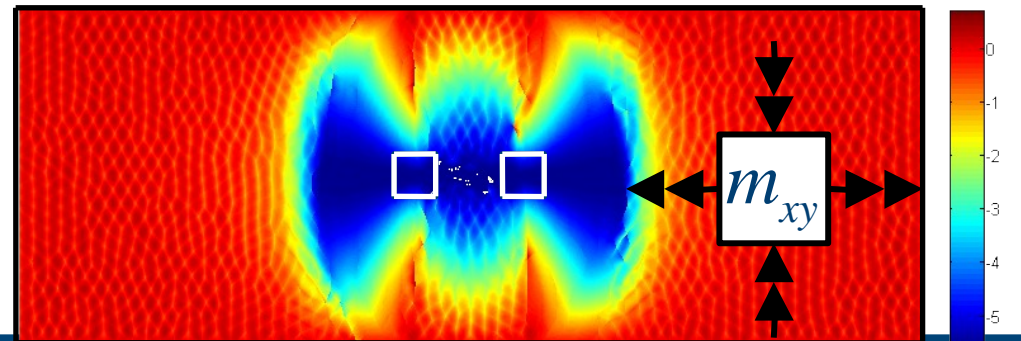
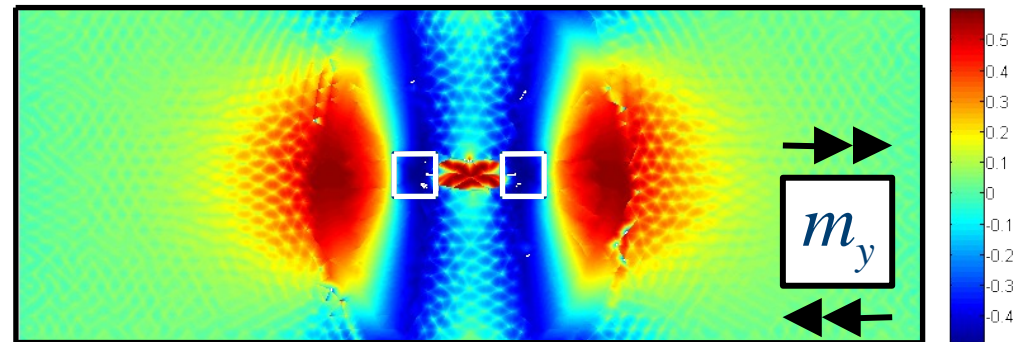
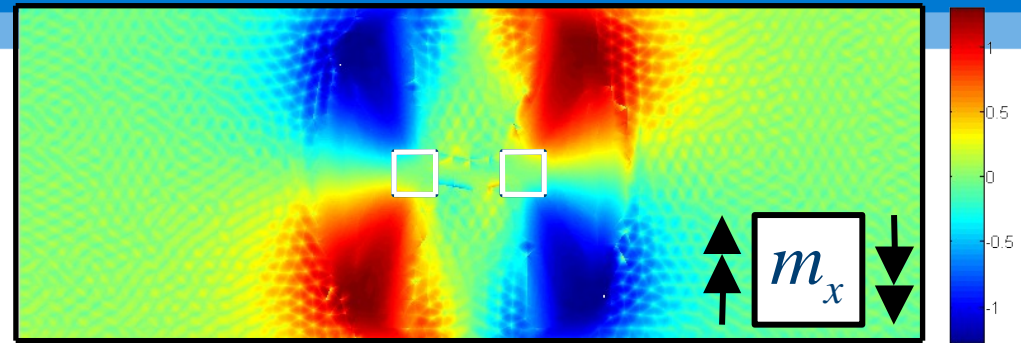


Bridge Slab: Lower Bound Analysis

Collapse load



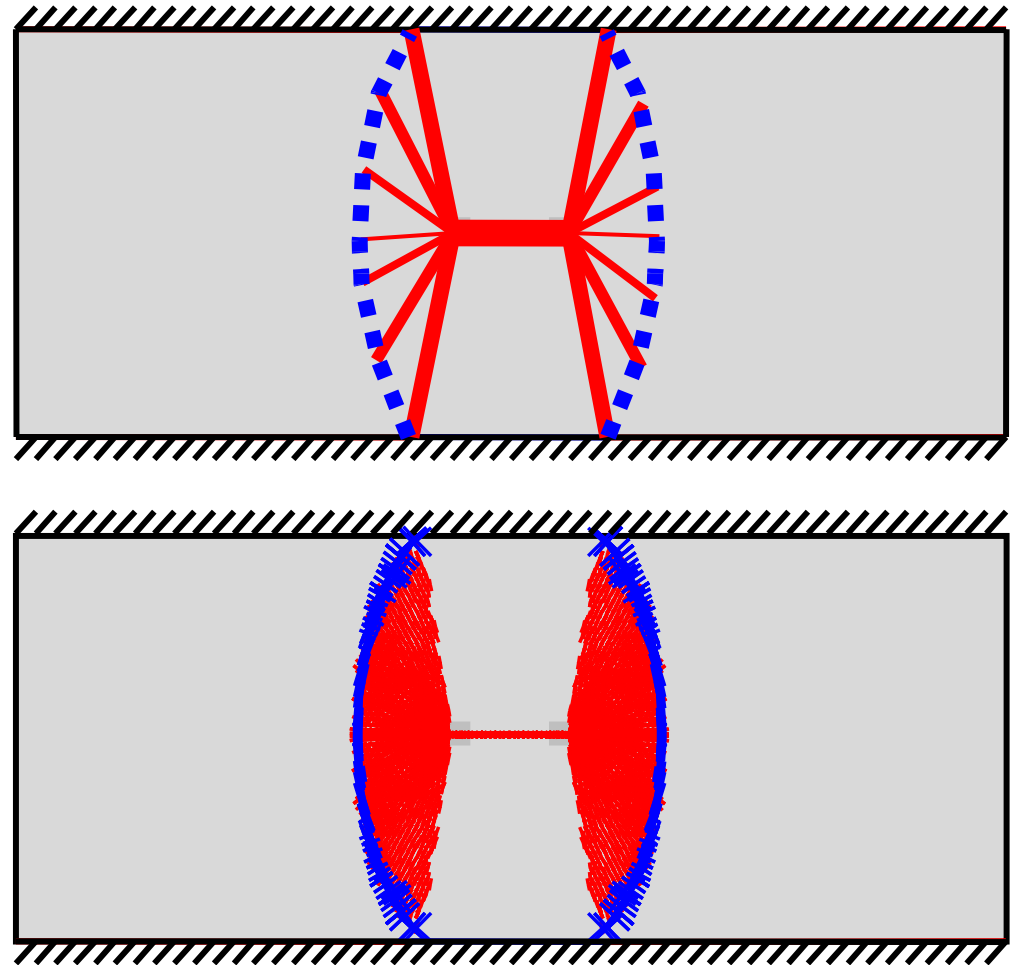
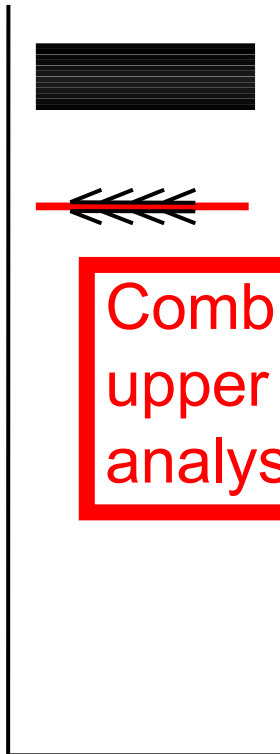
Plastic lower bound analysis



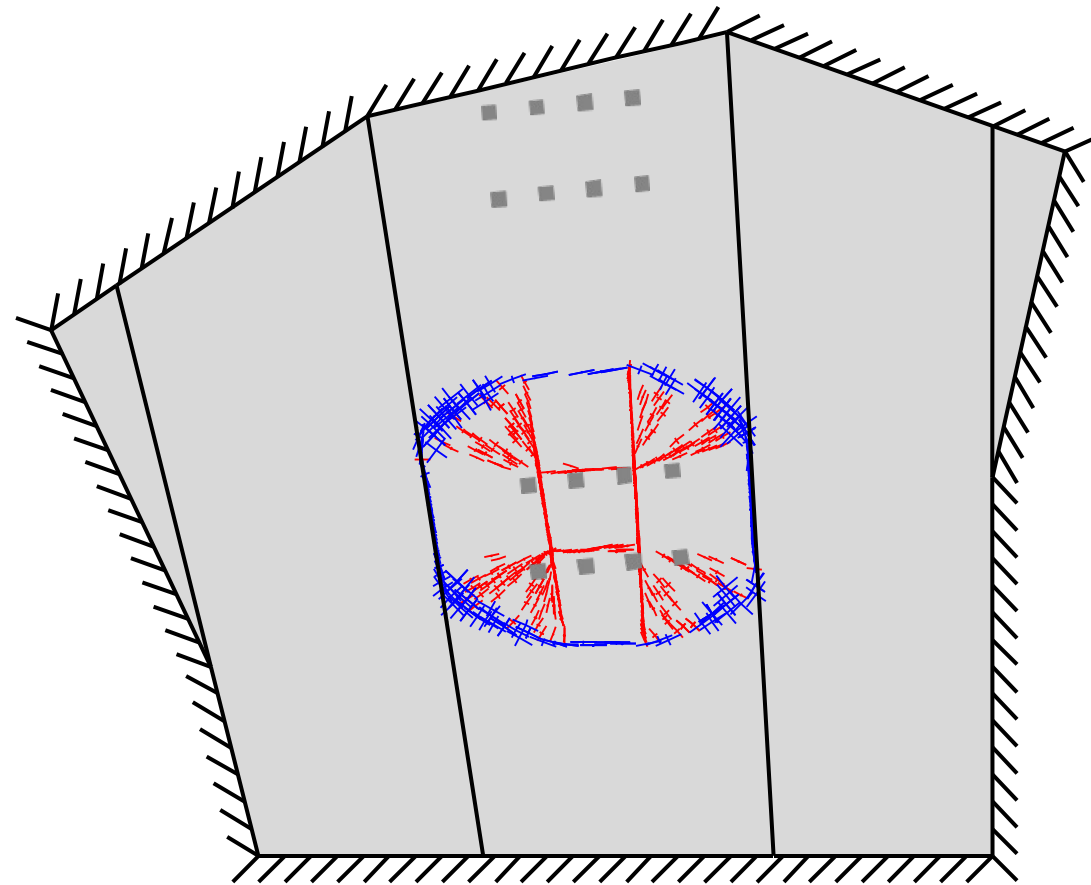
Bridge Slab:

Independent Lower and Upper Bound Plastic Analysis

Collapse load



Tyne Tunnel: Lower Bound Analysis



Tyne Tunnel: Upper Bound Analysis

