Structural Stress Method
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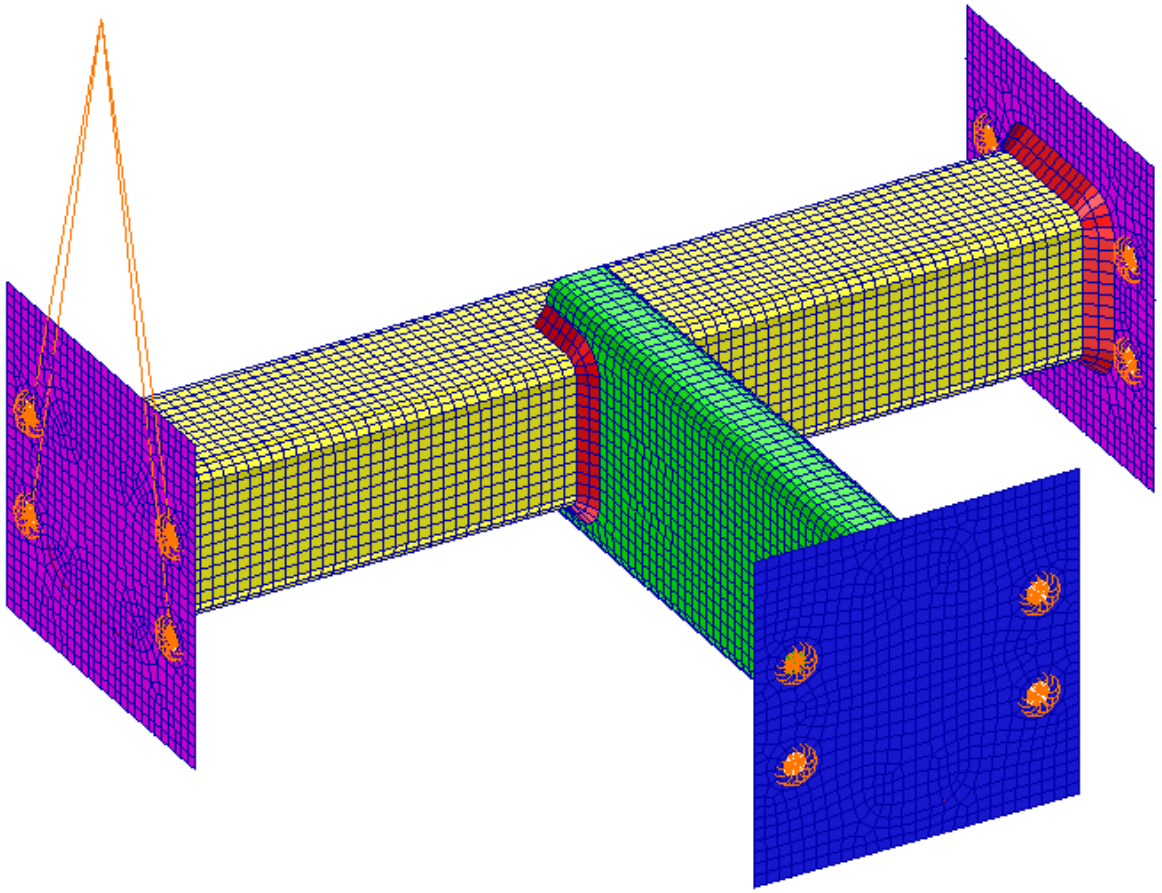
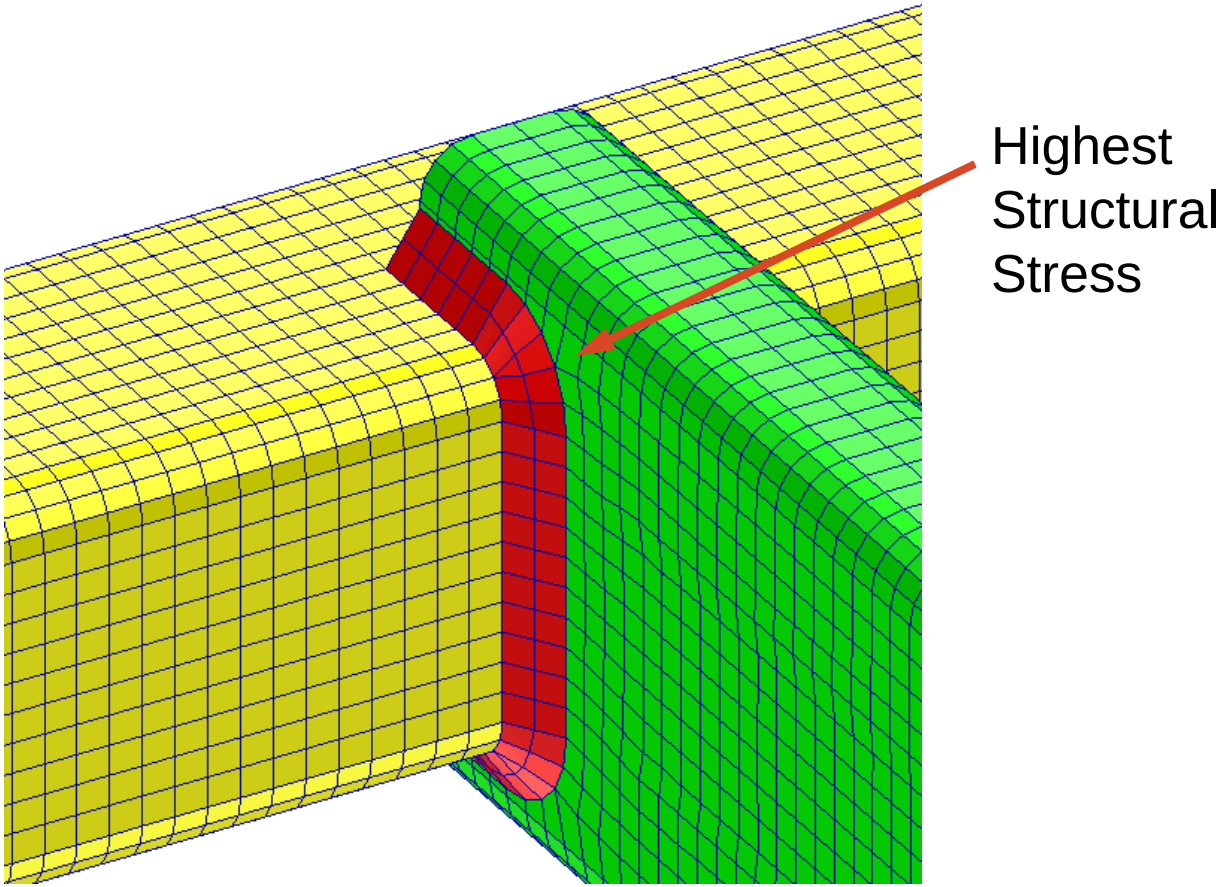
Reasons International is pursuing this

- Mesh insensitive
- Can distinguish between one-sided and two sided welds, as well as weld ends
- Can distinguish between full penetration and partial penetration welds

Structural Stress - Model



Structural Stress - Results



Structural Stress - Results

From Weld Challenge I

- Load Range = 8000 lb
- Equivalent Structural Stress Range
  ESS = 245.9 MPa
  (Full penetration assumed. Slightly different results than previously reported due to a correction of a minor programming error.)
- Scale Factor = 0.0307 MPa/lb

Structural Stress - Results

- Life estimates using LifEst (Somat EASE)
- Created a “material” with appropriate stress-life parameters to mimic the ESS master curve provided by Battelle
- Grapple skidder time history was unscaled
- No mean stress correction

Structural Stress - Results

- 6106 lb peak
  - Total SF
    19.2 lb/bit * 0.0307 MPa/lb = 0.5902 MPa/bit
  - 2362 blocks
- 8618 lb peak
  - Total SF
    27.1 lb/bit * 0.0307 MPa/lb = 0.8330 MPa/bit
  - 824 blocks