Redundancy Guidelines for Pedestrian Truss Bridges

Dan Walsh, PE
Overview

- Need national and state guidelines on redundancy for uncommon bridges that include concrete structures
- FIGG’s mis-interpretation of redundancy for FIU pedestrian bridge
Bridge Redundancy

• FIU bridge single row of diagonal supports
  - Each member was nonredundant
• Traditionally, truss design has 2 sets of regularly spaced vertical truss pieces
• Concrete truss bridges are rare
  - Research found no other designs
• Truss bridges typically constructed of steel
FIGG’s Interpretation of Redundancy

• Redundancy can be provided
  - Load path redundancy
  - Internal redundancy

• FIGG believed pedestrian bridge was redundant
  - Internal redundancy – longitudinal and transverse tendons, including PT rods

• Lack of load path redundancy
Need for National Guidance

- AASHTO LRFD Bridge Design Specifications
  - Addresses redundancy in design of steel truss structures
  - Limited discussion of redundancy for concrete structures
- No discussion of redundancy in AASHTO LRFD Pedestrian Bridge Specifications
Need for FDOT Guidance

• FDOT Structures Design Guidelines do not discuss redundancy of concrete structures
• FDOT and AASHTO guidance focuses on redundancy for steel bridges
  - Not unique design of concrete truss bridges
Summary

- Limited or no guidance on redundancy for concrete structures in AASHTO and FDOT specifications
- Bridge design specifications need to address redundancy for concrete bridge designs