BRIDGE WITHIN A BRIDGE

A Practical Approach for Stone Masonry and Concrete Arch Preservation
Project Background
Project Background

- 100 feet long (16 – 20 – 16)
- Stone Masonry & Concrete
Project Background

- Upper Bank Nursery
- Fairman R. Furness
BRIEF DOCUMENTARY

https://youtu.be/QPYUJ6MwJVo

YouTube
Findings & Analysis

- Transverse through crack of Span 3
- Spandrel wall and ring separation
- Outward rotation of spandrel wall
- Settlement and rotation of Abutment 2
- Scour and undermining of Piers
Findings & Analysis

- Military Engineering eXperimental Establishment Method (MEXE)
  - Arch Geometry
  - Depth of Fill
  - Material
  - Mortar Condition
  - Crack spacing and orientation
Findings & Analysis

- HD Laser Scanning
- 3D Point Cloud
Span 3 - Typical Section

- Intrados of concrete ring
- Transverse crack and displacement
- East Abutment rotation
- Pier 2
Constraints

- Bridge Aesthetics
- Upper Bank Nursery
- Access
Solution & Considerations

- Build a new r/c structure within existing
  - Replace Span 3 and Abutment 2
  - Pier and Abutment Aprons
  - Reuse masonry, repoint structure
  - GP 11 Permit
Solution & Considerations

- Cofferdams
- Ford style crossing
- Pump truck for pours
- Arch stability and temporary bracing

- VIDEO
Solution & Considerations

- Arch stability and temporary bracing
Construction

- Six months
- Completed December 2015
- Total project cost
  - < $1,000,000 USD
THANK YOU

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THE WIRT THOMPSON FAMILY
OWNERS
THANK YOU

QUESTIONS?