

PROJECT

Manitou Springs Arch Bridges
Manitou Springs, Colorado

CLIENTS

The City of Manitou Springs
Manitou Springs, Colorado

PROJECT DESCRIPTION

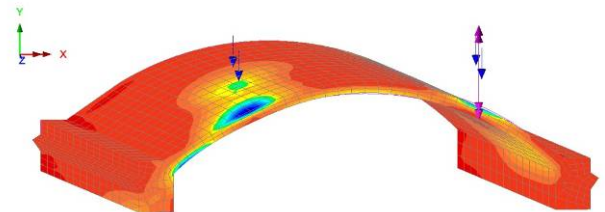
Atkinson-Noland & Associates worked with Bridge Diagnostic, Inc. to evaluate the structural response of two historic concrete arch bridges. Structural load tests were conducted on the bridges, and displacements and strains were monitored at several critical locations along the arch barrel. Our engineering team implemented a 3D finite element analysis (FEA) to analyze the bridges under current AASHTO loads. The FEA model was calibrated using measurements from the load test. Strengthening was required as the existing structures were found inadequate under current design criteria. A new post-tensioned concrete arch was designed to be cast in place on top of the existing arch. The design was based on a 3D FE analysis, which was required to optimize the new arch thickness and tendon layout and investigate the interaction between the old and new structures. Drawings and specifications were produced in conformance with Colorado Department of Transportation (CDOT) requirements.

SERVICES PROVIDED BY ATKINSON-NOLAND

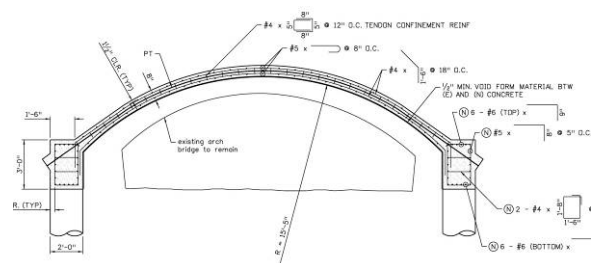
- Engineering support during live load test
- 3D finite element analysis
- Evaluation of existing bridge capacity
- Strengthening design
- Drawings and specifications



Canyon Ave Bridge



3D FE analysis of new post-tensioned concrete arch



Section showing typical reinforcement of new post-tensioned concrete arch



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