BULLETIN

News from SubTerra, Inc.®

Historic Bridge Load Testing and Instrumentation
Leominster, Massachusetts

SubTerra, Inc. *installed and monitored fiber optic strands and dynamic crackmeters to monitor the dynamic performance of an historic dry stone bridge in Leominster, MA. Load tests were performed dynamically while running loaded and pre-weighed gravel trucks across the bridge individually and in tandem formation. Significant performance differences were observed for the east and west sides of the bridge.*

As the project's Instrumentation Consultant ***SubTerra, Inc.*** was responsible for:

1. Designing the instrumentation layout.
2. Installing and monitoring fiber optic instrumentation.

The Leominster Bridge is a two-span stone masonry arch bridge. The barrels and spandrel walls are constructed of gray granite laid in running bond. The spans are approximately 40 feet each and rise approximately 12.5 feet from spring line to crown. The bridge carries two-way traffic on Massachusetts Route 13 and has pedestrian walkways on both sides of the bridge.

Instrumentation consisted of surface mounted strain gages at the quarter points of each span, crack gages to monitor existing cracks, and pressure transducers to measure compressive stresses within the arch. All instrument cables were routed to a data acquisition system located near the northeast corner of the bridge.

Numerous longitudinal cracks in the east barrel near the north spandrel wall were monitored using dynamic crackmeters.

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