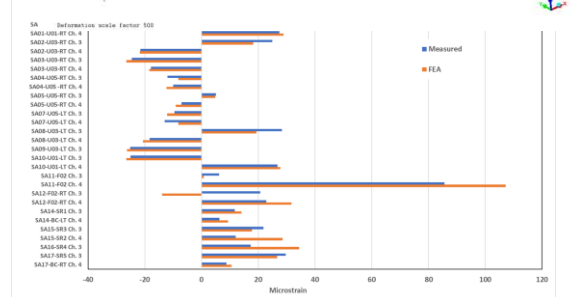
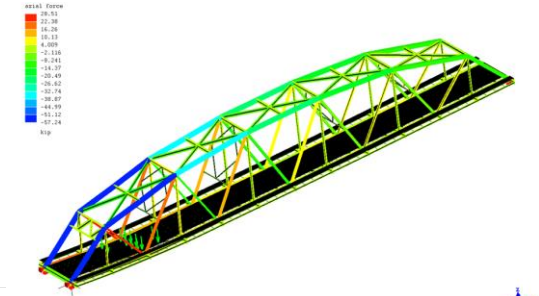
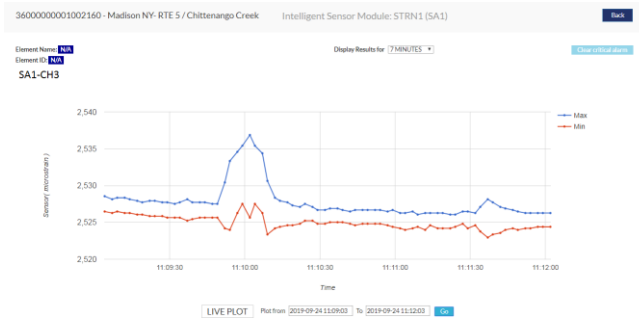
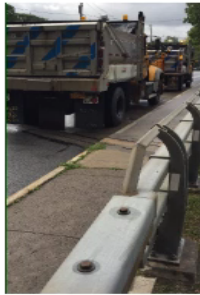


Chittenango Live Load Test

IntelliStruct: Test Results Strain Measurement



IntelliStruct: Results Digital Twin Model vs. Live Load Test

Chittenango Bridge -- NYS DOT

PROBLEM

A 1970 concrete – steel girder bridge with visual deck cracks and assumed highway fluids intrusion required analysis to determine if the structure could support an asphalt overlay without instituting a load restriction.

DECISION

NYS DOT implemented **IntelliStruct Bridge Performance Management Platform** on the Chittenango Bridge for structural monitoring, analysis with a digital twin and calibration of performance using live load testing to determine if they could rehabilitate the bridge with no restrictions.

ANALYSIS

A live load test procedure was designed scaling the weight and stress the bridge with multiple runs of trucks located in different places on the bridge and at different speeds. A video showing a single test is shown above and the corresponding strain data from 1 of 9 strain gauges measuring the stress on each girder supporting the bridge. The analysis compared the results of the Digital Twin model of how the bridge would perform when first built and running a simulation of the same weight and speed of the trucks used in the test. The graph above charts the results from the model as new to the actual results from the live load test on the 50-year-old bridge

RESULTS

The bridge was modeled using a Digital Twin and the addition of an asphalt membrane was simulated. Indication from measured performance analytics is that the bridge can be rehabilitated with no restriction and will result in extended bridge life

Continuous monitoring will allow bridge performance to be analyzed monthly and trended to determine seasonal variation and bridge performance over time.