Geocomp

Technologies to manage risk for infrastructure

Project Brief

Vernon Avenue Bridge

Client:

Massachusetts Department of Transportation (MassDOT)

Location:

Barre, MA

Service Provided:

- Developed and implemented instrumentation plan

Value Provided:

- Long-term monitoring captured vital data of bridge responses to stresses and temperature

Background & Project Challenges

The Vernon Avenue Bridge in Barre, Massachusetts, is part of a research project focused on understanding the way bridges are designed, constructed, and managed. As part of a collaborative effort, the National Science Foundation – Partnership for Innovations (NSF-PFI) selected a team of researchers to evaluate bridge design procedures and to facilitate long-term monitoring, as well as develop protocols for a structural health monitoring using the Vernon Avenue Bridge as a model. The bridge is a three-span, continuous, steel girder bridge with a composite reinforced concrete deck and is an essential part of the local community. The bridge measures 47 meters long (154-ft) with a 23.5 meter center span (77-ft) and two 11.75 meter secondary spans (38.5-ft). There are six main girders, evenly spaced at 2.25 meters (7.4-ft) apart, which run the length of the bridge.

Geocomp Role & Accomplishments

Geocomp developed and implemented an instrumentation plan which included 100 strain gauges, 36 steel thermistors, 30 concrete thermistors, 16 biaxial tiltmeters, and 16 uniaxial accelerometers at 13 stations along the length of the bridge. Data from these sensors have been continuously collected using *iSite*™ data acquisition boxes provided by Geocomp Corporation since the Fall of 2009.

Strain sensors and thermistors are distributed along the length of each girder on both sides of the web with the exception of the exterior girders, which only have instrumentation on the interior face. Each girder was fabricated in two parts with a splice located just off the north pier. All *iSite*™ boxes were placed on the south end of the girders for ease of access to a power supply.

The sensor locations were selected by the research team to best capture the bridge response and then viewed by the bridge designers and management team. It was vital to get the input from all parties related to the life-cycle of the bridge in order to maximize the future benefit of this instrumentation plan.