



PROJECT BRIEF

MIDOT Asset Management State-Wide Bridge Monitoring

PROJECT PROFILE

CLIENT:

Lawrence Technical University
Michigan Department of
Transportation (MIDOT)

LOCATION:

Michigan

VALUE:

- Integrated all five bridges into unified database monitoring system for statewide monitoring program

SERVICES PROVIDED:

- Development of instrumentation plans for each bridge
- Installed and commissioned remotely positioned structural monitoring system for each bridge
- Performed load testing prior to bridge opening
- Annual maintenance and reporting for each bridge

“Each bridge has its own stand alone, remote access, continuous data collection system to provide data during and after construction.”



ASSET MANAGEMENT MONITORING AND DATA MANAGEMENT COLLECTION

During the fabrication process, each of the five bridges were instrumented to evaluate the operations of the bridge structures, including constructability and performance during construction, and to gather a measured response from load testing and long-term performance. Based on the type of bridge and composition of carbon fiber structural elements, Geocomp developed an instrumentation plan specific to each bridge. Instrumentation included internal/external strain gages, custom built load cells and displacement transducers, and precision survey monumentation to measure beam/girder camber for both the short and long term. Each bridge has its own stand alone, remote access, continuous data collection system to provide data during and after construction. The iSiteCentral® GIS database monitoring system provides monitoring hardware, and documentation record keeping all integrated under one password protected platform providing a unified system for asset management purposes.



BACKGROUND

Through research and development efforts, Lawrence Technological University and the Michigan Department of Transportation (DOT) have been developing and implementing the use of carbon fiber reinforced polymer materials for major bridge components. Current uses include carbon fiber reinforced polymer (CFRP) post-tensioning cables and barrier walls, carbon fiber composite cable (CFCC) for transverse post-tensioning, and new fiber composite material for reinforcing concrete (NEFMAC) grid reinforcement for bridge decks. These new materials help combat the effects of steel reinforcement corrosion, provide long-term durability of bridge structures, and require less maintenance. Currently five bridges have been constructed in Michigan using these materials.