

## **REQUEST FOR QUALIFICATIONS STRUCTURAL HEALTH MONITORING SYSTEM – I-74 OVER THE MISSISSIPPI RIVER**

On behalf of the Iowa Department of Transportation (DOT), Alfred Benesch and Company (Benesch) seeks qualifications from contractors with experience in installation of structural health monitoring systems. Final design is nearing completion for a new I-74 bridge over the Mississippi River, to be constructed 2017-2020. The proposed river bridge is comprised of two 15-span structures, eastbound and westbound, approximately 3400' long. The main span in each direction over the river navigation channel is approximately 800' long and is supported by a basket-handle steel arch. The approach spans have continuous steel plate girders.

A program to collect scientific measurements of predetermined design and maintenance parameters is to be implemented for the proposed I-74 bridge over the Mississippi River. These measurements will begin during construction and continue into the service life of the bridges. In order to collect the measurements, a dedicated on-site Structural Health Monitoring (SHM) system will be installed during construction. The system will consist of various sensors, and data acquisition equipment.

Supply and installation of the Structural Health Monitoring (SHM) system and the associated cabling, conduits, pull boxes, junction boxes and cabinets is included in the work of Project 198, which consists primarily of construction of the arch span in both the EB and WB I-74 bridges over the Mississippi River. However, the SHM system installation and deployment work, including collection of data during bridge construction, must be performed by a contractor qualified for this specialty work. It is anticipated that the Project 198 Contractor will engage a subcontractor for the SHM work.

SHM work for this project includes furnishing and installing (approximate quantities for data collection during the life of the bridge are shown in parentheses): vibrating wire surface mounted strain gages (128), strain transducers (218), embedded corrosion sensors (10), leaf wetness sensors (40), temperature and relative humidity probes (8), vibrating wire tilt meters (4), vibrating wire displacement transducers (16), Wheatstone bridge load cells (12), accelerometers (10), thermocouples (4), multiplexers (42), and data loggers (42). Most of the locations are on the main arch span, both on and under the bridge deck and on the steel arch ribs, but a few are located on the approach bridge spans, so coordination may be required with the Contractor for that project, if it is let separately from the arch project.

In addition to the permanent installations listed in the previous paragraph, sensors and data collection equipment (temporary system) are required to monitor forces in standing towers and temporary tieback cables (temporary structures) used for the erection of the arches. Work associated with the arch erection, to be performed by the SHM contractor, includes: preparing a Monitoring System Plan for the temporary structures, for approval by the Engineer; furnishing, installing, testing and maintaining the temporary system; collection of data from the temporary system at each erection stage for comparison to structural calculations prepared as part for the Arch Erection Contractor's erection plan.

Data collection from some of the permanent SHM system sensors may also be required during construction.

Data collection and analysis after completion of the construction project is expected to be performed by Iowa State University.

The Iowa DOT has tasked Benesch with preparing a list of contractors qualified for SHM installation and deployment. To apply for inclusion on this list, please submit the following contractor qualifications for review:

1. Details of at least four projects similar to this one (SHM for a major bridge), completed within the last fifteen years, including:
  - a. Description of structure(s)
  - b. Construction cost
  - c. Structure owner, with contact information including name, phone number and email address of responsible person familiar with the SHM system who may be contacted as a reference
  - d. Approximate number and types of sensors, gauges, etc., installed
  - e. Approximate date work was completed
2. Name(s) and qualifications of lead technician(s) who will install the system, including:
  - a. Brief descriptions of four projects similar to this one, with this contractor or others, completed within the last fifteen years, including technician's role

Qualifications may be submitted in pdf format, via email to:

Sara L. Davis, PE, SE, Project Manager, Alfred Benesch & Company, at [sdavis@benesch.com](mailto:sdavis@benesch.com).

Please send any questions regarding this RFQ to the above email address, by end of business day, August 23, 2016.

Deadline for submittal of qualifications is end of business day, October 18, 2016.

Applicants will be informed of prequalification status by December 13, 2016.