ITEM 557.1201 11 - STRUCTURAL HEALTH MONITORING SYSTEM

DESCRIPTION

This work shall consist of the supply and installation of a structural health monitoring system ***for the Main Span and abutments*** to include 20 - 25 sensors to be used by the Department to evaluate the in-service structural performance during the life of the structure.

MATERIALS

The Contractor shall furnish all materials and equipment required to properly collect, track, monitor and assess the structural characteristics as described for the Main Span and abutments. The data shall be accessible from either a PC or mobile device and shall conform with NYS IT standards and be integrated with NYSDOT's operation system and network. The service life of the sensors and equipment shall be at least 50 years when they cannot be replaced by the Department.

CONSTRUCTION DETAILS:

The structural monitoring system shall include sensors capable of monitoring strains, stresses, inclinations, temperature, deflections, settlements, etc. at critical or controlling locations and components. The system should also be capable of measuring loading conditions (e.g. traffic loads) causing the changes in the physical parameters monitored.

A. Advance Preparation

Within 270 to 365 days prior to construction completion of the main structure and abutments, the contractor shall propose the most current technological specifications for the sensors and equipment to the Deputy Chief Engineer, Structures for approval. to confer what After approval by the DCES, the Contractor shall incorporate sensors and equipment into the main structure and abutments. Based on the discussion and comments received, the Contractor shall prepare and submit the instrumentation and monitoring plan to the DCES for review and approval a minimum of 180 days prior to completion of the construction of the main structure.

B. Before the structure is open to traffic, the Contractor shall collect baseline data and provide the data to the Department, along with data analysis comparing comparison to design values, so that the in-service condition can be monitored by the Department. The Contractor shall provide threshold parameters, whenever possible, such that the Department can use them in the future to understand if there is a structural or operational issue that should be addressed.

The system shall provide the following capabilities:

1. All sensors shall be wireless;
2. Ability to adjust data collection rates and times;
3. All sensors and equipment shall be chosen such that they are readily available in the market (i.e. off-the-shelf systems)
4. The Department must be able to replace the sensors with relative ease;

5. The data collection system shall be centralized and web based such that it can be accessed using the internet;
6. The system shall be safe from in-service and inclement weather conditions

A manual that details installation, sensor and data acquisition system specifications, maintenance and operational instructions, data analysis algorithms and instructions to modify them as needed, manufacturer information, and warranty information shall be provided to the Department.

METHOD OF MEASUREMENT

This work will be measured on a lump sum basis.

BASIS OF PAYMENT

The lump sum price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.