SP-150206a
(Replaces SP-150206)

SPECIAL PROVISIONS
FOR
ERECTION REQUIREMENTS

Scott County
IM-NHS-074-1(198)5--03-82

Effective Date
April 25, 2017

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150206a.01 DESCRIPTION.
This work includes special erection requirements applicable only to Span 12.

150206a.02 QUALIFICATIONS.

A. ~~Employ an Erection Contractor to erect the structural steel that is certified as an Advanced Certified Steel Erector (ACSE) by the AISC Certification Program. Submit evidence of current ACSE Certification to the Engineer with submittal of the proposed erection plan.~~ The entity to erect the structural steel must be either certified as an Advanced Certified Steel Erector (ACSE) by the AISC Certification Program, or can and will obtain such certification prior to erecting the arch spans. Submit evidence of current ACSE Certification to the Engineer with submittal of the proposed erection plan. In addition to the ACSE Certification, the entity erecting the structural steel shall submit a project reference list verifying their experience as the erector in the successful erection and construction of at least three bridges containing welded steel box member with a minimum box dimension of 24 inches, a span length of at least 350 feet, and at least one of which must be an arch, completed within the last 10 years. Provide a brief description of each project with the owner's name and current phone number.

B. ~~Retain the services of an engineering firm, pre-qualified with the Iowa DOT in the Steel Bridge Design category, for the completion of a project-specific erection plan.~~ Provide an erection plan, drawings, and calculations for the proposed erection of the structural steel that are signed and sealed by a Professional Engineer licensed in the state of Iowa, herein referred to as the erection engineer.

150206a.03 CONSTRUCTION.

A. General.

1. Assume responsibility for the stability of all elements of the partially erected structure under any and all erection loading or wind loading for all stages of erection and deck construction.

This includes all components subjected to erection live loads, loads imposed during casting of the concrete deck, and wind loads.

2. Assume responsibility for any special permits or measures required to accommodate the proposed erection methods.

B. Special Wind Concerns.

1. Wind studies indicate that vortex induced motions may occur during construction. Specifically, these vortex induced motions are expected to occur when the freestanding arches are fully erected, but prior to erecting the floor system steel.

2. Provide necessary measures to mitigate against these vortex induced motions during construction.

C. Erection Plans.

1. The erection methods and sequences assumed by the designer and indicated in the contract documents are one possible method to accomplish the erection and are for information purposes only. If these methods are utilized, verify the scheme, loads, and stresses in every detail for accuracy and applicability.

2. Provide an erection plan that is complete in detail for all phases, stages, and conditions anticipated during erection. Include structural calculations and supporting documentation necessary to completely describe and document the means, methods, temporary support positions, loads, deflection and survey control data, temperature effects, wind limitations, and wind mitigation measures necessary to safely erect the structural steel in conformance with the contract documents and as outlined herein. Address and account for all items pertinent to the steel erection including such items as sequencing, falsework, temporary shoring and/or bracing, girder stability, crane positioning and movement, means of access, pick points, segment shape, permissible deformations and roll, interim/final plumbness, cross frame/diaphragm placement and connections, bolting and anchor bolt installation sequences and procedures, blocking and anchoring of bearings, and procedures which will be used for geometry correction in the event that correction is required. Assume responsibility for the stability of the partially erected steel structure during all phases of the steel erection. Ensure appropriate bracing and support is supplied to resist construction wind loads during all stages of erection.

3. Develop a set of procedures, prior to erecting the arches, for adjusting the geometry of the arch ribs should difficulties be encountered in fit-up of the intermediate strut or segment R7. These procedures should provide guidance to the erectors for what adjustments should be made to affect various changes in geometry that might be needed to close the arches at the struts or at the crown.

4. Describe in complete detail the survey control procedures which will be followed to ensure that the distribution of loads in the structure during erection and at closure of the arch is compatible with design requirements and assumptions.

5. Submit the erection plans and procedures to the Engineer for review and acceptance prior to starting the work. Review, acceptance and/or comments by the Contracting Authority shall not be construed to guarantee the safety or final acceptability of the work or compliance with all applicable specifications, codes, or contract requirements, and shall neither relieve the Contractor of the responsibility and liability to comply with these requirements, nor create liability for the Contracting Authority. Significant changes to the erection plan in the field must be approved by the erection engineer and accepted by the Engineer for the Contracting Authority.

6. Should the proposed erection plans require the substitution of members or connections having dimensions or properties of equal or greater value than those shown on the plans, the substitutions shall be provided at no additional cost to the Contracting Authority and shall be subject to the approval of the Engineer as specified herein. Substitution with members of lesser dimensions or properties will not be permitted.

D. Construction Survey.

1. Provide, at a minimum, a construction survey of erected structural bridge members after each pair of arch rib segments have been erected and prior to erecting the next arch rib segment at that location. Provide additional survey as required to control the work and as directed by the Engineer. At a minimum, check the alignment and elevation of each end of the erected arch rib and alignment and elevation of the stiffening girders. Record elevations on both sides of the structure at each location surveyed. Provide provisions for measuring the load in all temporary forestays, tiedowns, struts, braces, ties, and/or supports and measure these loads concurrently with each described survey.

2. Maintain a log of construction survey and load measurements for the erection, including all adjustments required to correct alignments and elevations. Record the time, temperature, and location of all construction loads for each entry. Sign each entry and submit to the Engineer for signature prior to proceeding with the work.

E. Monitoring System Plan for Erection Equipment.

1. Monitor forces in standing towers and temporary tieback cables used for the erection of the arches. Prior to installing any sensors or data acquisition equipment, submit to the Engineer, for review and acceptance, a monitoring system plan. This plan shall, at a minimum, include the following:
- **a.** A complete listing of all proposed sensors along with manufacturer's specifications and manuals.
- **b.** A complete listing of all proposed data collection equipment along with the manufacturer's specification and manuals.
- **c.** Schematic drawings showing proposed installation procedures for each sensor type, including sensor orientation.
- **d.** Schematic drawings and or narratives describing how and when each sensor will be installed into the data collection system, how the sensor data will be collected during construction and a timeline of sensor and data collection equipment installation relative to the bridge construction.
- **e.** Plan for protecting the equipment before, during and after installation.
- **f.** Schematic drawing of final monitoring system configuration.

2. Store all sensors and data acquisition equipment in a climate controlled facility prior to installation. The equipment shall not be exposed to environmental conditions beyond the manufacturer's recommendations. ~~The Contractor superintendent in charge of the sensor installation shall have a minimum of 4 years of experience with installation of similar sensors.~~ Install sensors utilizing manufacturer supplied mounting brackets. Take care to route cabling in a manner that will protect it from ongoing construction activity. Protect exposed wiring in a conduit. Demonstrate that the installed sensors are in good working order and functioning. Repair or replace any sensors determined to be defective after installation.

3. Installation and deployment of the sensors and data acquisition equipment must be performed by a contractor qualified for this specialty work (the SHM contractor). Refer to the Contractor Qualifications section of the Special Provisions for Structural Health Monitoring and Instrumentation for SHM contractor qualification requirements.

~~3~~ 4. Download data from the sensors during each erection stage. Collect the data at night to minimize temperature effect on the data collected. At each erection stage, compare the results of collected data to structural calculations as required by these special provisions. Include the comparison in a report, signed and sealed by a Professional Engineer licensed in the state of Iowa, and submit to the Engineer. Include in the report the acceptance range, in percent, for measured versus design forces, which is to be determined and stipulated in the erection procedure submittal. Determine the course of action to be taken if the measured forces are not within the acceptance range and shall be included in his erection procedure submittal.

F. Health Monitoring System.
Coordinate all construction activities with the installation of the permanent health monitoring system.

150206a.04 METHOD OF MEASUREMENT.
No measurement will be made.

150206a.05 BASIS OF PAYMENT.
No payment will be made. Erection requirements and monitoring will be considered incidental to the various structural steel items included in this work.