SP- 150344
(New)

SPECIAL PROVISIONS
FOR
AESTHETIC ARCH TRUSS ERECTION PLAN

Dubuque County
NHSX-032-1(40)--3H-31
NHSX-032-1(42)--3H-31

Effective Date
December 19, 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.

150344.01 DESCRIPTION.

This work shall consist of developing, engineering and submitting a detailed Aesthetic Arch Truss Erection Plan which shall include erection plans and procedures substantiated with appropriate erection engineering calculations.

150344.02 CERTIFICATION.

The Aesthetic Arch Truss Erection Plan submittal consisting of erection plans and procedures shall be certified by a Professional Engineer licensed in the State of Iowa, known in this document as the Erection Engineer. Erection engineering calculations used in the preparation of the Aesthetic Arch Truss Erection Plan shall only be submitted if requested by the Engineer. If the Engineer requests erection engineering calculations, they shall be submitted with the certification of the Erection Engineer.

150344.03 DETAILS OF AESTHETIC ARCH TRUSS ERECTION PLAN SUBMITTAL.

A. Review.

The Engineer shall be allowed a minimum of 30 working days to review the submittal. The Engineer shall provide notification to the Contractor either indicating “No Exceptions Taken” or “Revise and Resubmit”.

B. Erection Plans and Procedures Overview.

1. The term “erection plans” refers specifically to the engineering drawings prepared by the Erection Engineer describing and specifying the erection (i.e., the field-installation and member-placement) of the structural steel. Erection Plans may also refer in a more general context to the combination of engineering drawings and erection procedures describing and specifying the erection (i.e., the field-installation and member-placement) of the structural steel.

2. The term “erection procedures” refers to the documents which describe the specific sequence, methods, equipment, and other directives that the Contractor is to follow in erecting the structural steel. The terms “erection plans” and “erection procedures” are not synonymous, but the erection plans and erection procedures shall be fully integrated with each other and shall together describe and specify all aspects of how the structural steel is to be erected, including, but not limited to, sequence of erection, methods or techniques to be used, equipment to be used, and materials to be used along with any temporary works or other devices necessary.

3. The erection plans and procedures shall address all requirements for erection of the structural steel into the final designed configuration. Any and all written review comments provided by the Engineer shall be addressed to the Engineer’s satisfaction prior to the start of erection. As a minimum, the erection plans and procedures shall include consideration of all items described in Section D below.

C. Erection Engineering Calculations.

1. Appropriate erection engineering calculations to substantiate the structural adequacy and stability of the bridge system for each step of the steel erection shall be performed to substantiate the erection plans and procedures.

2. At a minimum and as appropriate, erection engineering calculations shall conform to the following guide specifications:
- Guide Design Specifications for Bridge Temporary Works, AASHTO, 2nd Edition, 2017
- Guide Specifications for Wind Loads on Bridges During Construction, AASHTO, 1st Edition, 2017

3. Erection engineering calculations to substantiate the structural adequacy and stability of the erected structure and any associated temporary works and/or temporary components do not need to be included in the Aesthetic Arch Truss Erection Plan submittal. However, the Engineer reserves the right to request the submittal of erection engineering calculations for review and approval at any time. If requested, such calculations shall be submitted within 14 calendar days of request by the Engineer.

D. Erection Plans and Procedures.

1. Plan of Work Area.
The erection plan shall include:
- a plan of the work area showing the proposed bridge,
- an elevation of the bridge span (including piers and risers) in which the arch truss is to be installed.
- the permanent support structures (piers and abutments),
- roads,
- railroad tracks,
- waterways (including location and dimensions of any navigational channel(s) and any navigational clearances which must be respected during construction),
- overhead and underground utilities,
- structures and conditions that may limit access (consideration of clearance requirements over roadways or railroads),
- staging or material storage areas,
- right-of-way and property lines,
- information, plans, etc. regarding maintenance of traffic requirements, lane or road closures, restrictions, durations, etc. necessary to protect public safety for all erection operations over or adjacent to live traffic,
- and any other information that may be pertinent to the steel erection.

2. Erection Sequence.

The erection plans and procedures shall indicate the sequence for connecting each truss section together to create the final assembled truss, noting the use of temporary support conditions, such as holding crane positions, temporary supports, falsework, etc. The erection sequence shall be shown in illustrative plan and section views of the bridge for each erection stage, highlighting the structural components to be erected, their weights and center of gravity locations, lifting crane locations for necessary picks, and any temporary support conditions that are necessary during the particular stage. The illustrative views shall be accompanied with a written narrative of the procedure to be followed by the steel erector, which shall state items such as structural components to be erected, use of temporary supports, use of temporary bracing, hold cranes, etc. Member reference marks, when reflected on the erection plans and procedures, should be the same as used on shop detail drawings.

3. Delivery.

The submittal shall indicate the delivery sequence, method of unloading, location, and orientation of all truss sections.

4. Crane Information.

a. The erection plans and procedures shall show the location of each crane to be used for each truss section pick as well as the assembled truss pick if necessary (see Section D.2.), the crane type, crane pick radius, crane support methods (crane mats, barges, work trestles, etc.), and the means of attachment to the assembled truss or truss sections being lifted or supported.

b. The erection submittal shall include capacity charts or tables that address and demonstrate the adequacy of each crane configuration, boom length, counterweight configuration, outrigger configuration, and pick weight required to do the proposed work. The erection plans and procedures shall also indicate any potential above- or below-ground obstructions or restrictions to crane operations (such as existing structures, utilities, etc.).

c. In the event that the submitted cranes are not available at the time of construction, the Contractor can propose alternate cranes, subject to review and approval by the Engineer. The submittal package for alternate cranes shall include capacity charts or tables that address and demonstrate the adequacy of each crane configuration, boom length, counterweight configuration, outrigger configuration, and pick weight required to do the proposed work; however, resubmittal of the full Aesthetic Arch Truss Erection Plan is not required.

d. Any plans associated with crane supports (such as crane mats, barges, work trestles, etc.) shall also be included. When applicable, manufacturers' certification documents or catalog cuts for pre-engineered devices or equipment may be used to meet this requirement; these items shall be included in the submittal and shall be subject to review and approval by the Engineer. Calculations for crane supports (crane mats, barges, work trestles, etc.) do not need to be included in the submittal, but the Engineer reserves the right to request their submittal for review and approval at any time. If requested, such calculations shall be submitted within 14 calendar days of request by the Engineer.

5. Truss and Truss Section Crane Pick Information.

The submittal shall include the lifting weight of the truss section picks as well as any truss section assemblies, including all rigging and pre-attached elements (such as cross-frames or splice plates). It shall also include the approximate center of gravity locations for the truss sections and any truss section assemblies.

6. Lifting Devices and Special Procedures.

a. The erection plans and procedures shall include the details, weight, capacity, and arrangement of all rigging (beam clamps, lifting lugs, etc.) and all lifting devices (such as spreader and lifting beams) required for lifting. The submittal shall also specify details for

rigging or lifting devices bolted or welded to permanent members, including the method and time (shop or field) of attachment and capacity, as well as methods, time, and responsibility for removal.

b. As necessary, the submittal shall provide special lifting/handling procedures for any truss section or assembly with potential stability or slenderness issues.

7. Bolting Requirements.
The submittal shall indicate the bolting requirements for splices and gusset plate connections for each stage.

8. Bearing Blocking and Tie-Down Details.
The submittal shall indicate blocking and/or tie-down details for the arch truss bearings, and associated force demands as necessary.

9. Load Restrictions.
Restrictions regarding wind loading, construction dead and live loadings, and any other applicable loading restrictions shall be included in the submittal, as necessary.

10. Temporary Supports.

a. The submittal shall include the location of any temporary support structures (see Section D.2.) and bracing, as well as details of the temporary support structure itself. If the temporary support is to be prefabricated (selected from a supplier's catalogue), the type and capacity shall be defined in the submittal, as necessary; lateral capacity as well as vertical capacity requirements shall be considered as appropriate. If the temporary support is to be constructed by the Contractor on site, a complete design with full details, including member sizes, connections, and bracing elements shall be provided in the submittal in accordance with Article 2408.03, L of the Standard Specifications. In either case, details regarding the upper grillage and temporary bearing assembly (i.e., details of how the steel truss or truss sections will bear on the temporary support), including the top of falsework (bottom of structural steel) elevations, shall also be included in the erection plans and procedures. In addition, all foundation requirements for temporary support structures shall be provided in the submittal.

b. The submittal shall indicate the location of hold cranes that are used to provide temporary support to the steel assembly (see Section D.2.) and the associated crane loads. The hold crane type, capacity, boom lengths, pick radius, and means of attachment to the truss or truss sections shall also be indicated in the submittal.

c. The submittal shall include the location and details for temporary tie-downs that are required to facilitate the steel erection, as well as the associated tie-down loads. At a minimum, the details shall include the tie-down, attachment devices, and anchoring devices.

d. The submittal shall clearly indicate when, and under what conditions, any temporary supports or holding cranes may be released in the erection sequence, and if they may be left in place while subsequent erection proceeds.

11. Jacking Devices.
The submittal shall indicate jacking devices that will be required to complete the steel erection. Their location, type, size, and capacity shall be indicated, as well as their intended use, sequence of engagement, load level, jack pressure table, and any other key parameters of their operation.

150344.04 CONSTRUCTION.

A. The Contractor is completely responsible for protection of the structural integrity of the arch truss and superstructure components from fabrication to final approved placement. Any damage sustained by structural steel, during erection shall be repaired or replaced by the Contractor, to the satisfaction of the Engineer at no additional cost to the Contracting Authority.

B. Changes in the approved Aesthetic Arch Truss Erection Plan will not be allowed except under one of the following two conditions:
- Changes in the Aesthetic Arch Truss Erection Plan shall be approved by the Engineer, or
- Changes in the Aesthetic Arch Truss Erection Plan shall be approved by the Erection Engineer only when the Erection Engineer is present on the construction site to approve the changes.

C. Upon completion of construction operations and Engineer approval, all equipment shall be removed and all existing ground lines and site conditions modified by the Contractor to facilitate construction activities shall be restored to undamaged existing condition unless approved otherwise by the Engineer.

150344.05 METHOD OF MEASUREMENT.
No measurement will be made.

150344.06 BASIS OF PAYMENT.
All costs of furnishing, submitting, and revising the Aesthetic Arch Truss Erection Plan shall be included under contract bid item Aesthetic Arch Truss Erection Plan.