

## SECTION 403 – STEEL STRUCTURES

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[Note to Designer: Include the below in contracts which involve structural steel for new bridges or structural steel for widened existing bridges. The below is not required for widened existing bridges with less than two (2) new lines of girders.]

### 403.03 INSPECTION AND TESTING.

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In the third paragraph, delete the first bulleted item and replace it with the following:

- Simple Steel Bridge Structures. Includes highway sign structures, parts for bridges (such as cross frames for straight bridges with skews of less than 30 degrees), and un-spliced rolled beam bridges.

In the third paragraph, delete the third bulleted item and replace it with the following:

- Fracture Critical Members Endorsement. Familiarity with procedures required to produce critical members in accordance with a fracture control plan as defined by AASHTO or AREMA.

Delete Paragraph (C) and replace it with the following:

#### **(C) Fracture Control Plan.**

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Steel bridge members or member components designated as Fracture Critical Members (FCM's) shall be subject to the provisions of the AASHTO LRFD Bridge Design Specifications and ANSI/AASHTO/AWS D1.5 Bridge Welding Code, Chapter 12.

The following Paragraph (D) is added:

#### **(D) Shop Preassembly And Survey.**

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##### **(1) General Shop Preassembly Requirements.**

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All structures which utilize field splices shall be preassembled at the steel fabricator's shop, unless noted otherwise in this specification or in the contract documents. All methods of preassembly shall be clearly shown on the Shop Drawings. All other methods of fabrication and fitment not defined in this section shall be as per the AASHTO LRFD Bridge Construction Specifications, 2004 Edition with current interims.

For the Purposes of Section 403.03(D), the following definitions shall apply:

“Section” – a portion of a girder between field splices and/or end bearing locations.

“Line” – the plan alignment of a girder as defined in the contract plans from girder end bearing to girder end bearing.

“Complete Assembly” – a method of preassembly by which the fabricator completely assembles a girder to line and camber. All girders which are less than 150 feet in length, or less than three sections shall be completely assembled in the fabricator's shop.

*“Progressive Assembly” – a method of preassembly by which the fabricator assembles a minimum of three sections or 150 feet of a girder (whichever is greater) to line and camber beginning at one end of the girder line. The fabricator shall remove previously assembled sections from the beginning end of the girder line and add additional sections to the advancing end while maintaining a minimum 3 sections or 150 feet in the progressive assembly at all times. Progressive assemblies shall consist of at least one section of the previous assembly (repositioned if necessary and adequately pinned to assure accurate alignment) at all times.*

*“Full Component Assembly” – a method of preassembly by which the fabricator fully assembles specific portions of a bridge superstructure to lines and cambers. When girders are continuous because of their attachment to transverse structural steel supporting beams, regardless of cross section, full component assembly of these elements is mandatory. Full component assemblies of transverse structural steel supporting beams shall include all structural steel work for one full span on both sides of the transverse structural steel supporting beams. False work that accurately represents the structural steel bearing locations and elevations as shown on the contract plans shall be constructed and used for all full component assemblies. No other points of support will be permitted. One hundred percent of the bolt holes within the full component assembly shall be reamed to size and checked for bolt fitment. Other portions of a superstructure may be required for full component assembly as specifically called for in the contract plans.*

*“Complete Structural Assembly” - a method of preassembly by which the fabricator assembles a complete bridge superstructure in its entirety to lines and cambers in order to verify proper fit and alignment. False work that accurately represents the structural steel bearing locations and elevations as shown on the contract plans shall be constructed and used for all complete structural assemblies. No other points of support shall be permitted. The structural steel shall be fully assembled in the sequence(s) and stages as depicted on the contract plans. Fifty percent of the bolt holes (every other bolt hole) within the complete structural assembly shall be reamed to size and checked for bolt fitment. Completely assembled structural steel shall be surveyed by a Licensed Surveyor. In accordance with Section 104.08, the Contractor shall submit Shop Drawings indicating the coordinate locations and elevations of all bearing locations, field splice locations, and tenth (10<sup>th</sup>) point locations of each span of each girder at the centerline of the girder. Discrepancies from the contract plans shall be clearly noted in all Shop Drawings. This method of assembly will not be required unless specifically called for in the contract plans.*

## **(2) Structure Type Specific Preassembly Requirements.**

*The completeness of preassembly required for each structure type shall be performed as defined below:*

### **(a) Straight Girder Structures Skewed Less Than 30 Degrees**

*As a minimum, the preassembly procedure for straight girder structures with field splices and all bearing lines skewed less than 30 degrees shall consist of either complete assembly or progressive assembly as defined above. Webs of girders may be oriented in the horizontal plane or the vertical plane. Girders shall be fully supported during assembly. The sequence of assembly shall mimic the Contractor’s proposed sequence of erection as closely as is practicable.*

*Straight girder structures without field splices and with all bearing lines skewed less than 30 degrees are exempt from the provisions of Section 403.03(D) unless explicitly noted otherwise in the contract documents.*

***(b) Structures Curved in Plan and/or Skewed 30 Degrees or More***

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*As a minimum, structures which are curved in plan as defined in Section 4.6.1.2 of the AASHTO LRFD Bridge Design Specifications and/or with any bearing line skewed 30 degrees or more shall meet the provisions of 403.03(D)2.a., and shall be assembled with webs oriented in the vertical plane. For multi-girder structures, each complete or progressive assembly shall consist of a minimum of two adjacent girder lines including diaphragms or cross frames as per the contract plans. Girder lines assembled by progressive assembly shall consist of at least two sections of an adjacent girder line which has been previously assembled, plus two more sections added to the advancing ends of the girder lines.*

***(c) Structures with Complex Framing Elements***

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*As a minimum, structures with complex framing elements, such as transverse structural steel supporting beams shall meet the provisions of 403.03(D)2.b. Portions of structures which contain transverse structural steel supporting beams shall be preassembled via full component assembly. Other portions of the structure may be assembled via complete or progressive assembly, as appropriate.*

***(d) Special Structures to be Completely Preassembled***

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*As a minimum, special structures which have been explicitly designated on the contract plans to be preassembled via complete structural assembly shall meet the provisions of 403.03(D)2.b. The complete and entire steel structure with all secondary framing members shall be preassembled at the fabricator's shop as a complete structural assembly.*