

4600000 STRUCTURAL STEEL AND MISCELLANEOUS METALS  
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comment: (7-14-14)

Table 460-1: Highway Metal Components: Should ITS poles be included in this?

Response: ITS poles are covered by sign or signal structures erected partially or completely over the roadway as described in Table 460-1 Highway Metal Components.  
No change made.

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Comment: (7-21-14)

1. In Table 460-1 Highway Metal Components, guardrails are identified as a fabrication category. Do you mean to include other guardrail elements such as steel posts, steel offset blocks, end anchorages and permanent crash cushions? If so, the reference to guardrails needs to be broadened.

Response: We consider the term “guardrails” to include all elements and components that make up the system.  
No change made.

2. In the past S931 Metal Dowel Bar Assemblies were considered for QC fabrication requirements. They are not included in Table 460-1. Were they omitted?

Response: Yes, they were not included here. Metal dowel bar assemblies are listed on the APL list per specification: “**931-3.1 Approved Product List (APL):** The dowel bar assembly used shall be a product included on the Department’s Approved Product List (APL).”  
No change made.

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Comment: (7-30-14)

**1. 460-4.2.2 Match Marking of Members and Assemblies** – Two issues: - Many markings are now done by CNC machines using pneumatic cutting tools to etch/scribe the part numbers or heat numbers, not low stress die stamps. We recommend the Specification include allowances and guidance for the use of CNC (computer numerically controlled) scribing/etching. - For fracture critical materials, restricting the markings to low stress or compression areas is not always possible. Many areas of the bridge with splice plates are in tension zones. And expecting

the Engineer to locate and approve the position of all the piece mark stamps will be problematic. We recommend this be revised to make it a goal to avoid tension areas, but when the entire piece is in tension, then give general guidance as to where to put the marking – near an edge, near a center, etc?

Response:

First response: The Department is currently engaged in a research with the use of CNC machining using pneumatic cutting tools. Based on the results of this research we will update this section as needed.

No change made.

Second response: Changed 460-4.2.2 next to last paragraph to read “Low-stress die stamp markings applied to fracture critical members shall be placed in locations or zones shown or described on the approved shop drawings. Low-stress or compression areas are preferred.”

Change made.

**2. 460-4.3.2.2** The revision requires engineer review and approval for any heat bending of plates and bars. This will seriously impact production, as normal fabrication daily involves heat to aid in bending, cambering, curving, and straightening. To require engineer review and approval for each application of heat will bring production to a standstill. Just below the revision, are specific instructions for heat bending, cambering, curving, and straightening. We recommend these stay as is, and the engineer approval be limited to any cases in which the procedure is expected to deviate from the specific instructions already provided.

Response: Added the following sentence under 460-4.3.2.2 after sentence one, “Heat-shrink methods as described in 460-4.3.4 are also permitted.”

Change made.

**3. 460-4.3.4.9.2 – Removal of Lubricants** – the revision requires a demonstration before the Engineer of the removal process. We see this being a problem, due to limited availability of the engineer. Currently, the QC plan details how the lubricant is to be removed, and the process is observed by the 3rd party inspector, and that should be sufficient.

Response: This is not a revision of the verbiage, only a numbering change. Not sure why this would be a problem now since the language has not changed.

No change made.

**4. 460-4.3.5.5 – Punching** – Most parts are now fabricated using CNC machines. A general requirement for thicknesses of materials to be “drilled in assembly” does not allow the fabricator to use his best judgement for managing the manufacturing process. As long as the parts are checked, and they align within tolerances, any drilling sequence or process should be acceptable. Again, these restrictions on drilling, punching, reaming, drilling in assembly – fail to account for the better accuracy of CNC parts.

Response: We do not see where normal CNC and other assembly provisions are affected by this change.

Changed the 1st paragraph of 460-4.3.5.5 to read “Subpunched or subdrilled holes, when required, shall be at least 3/16" smaller than the finished hole size.”

Deleted second paragraph.

Changes made.

**5. 460-5.4.5 Splice Plate Filler Material** – the revision reads: “... is less than ¼ inch...”.

Change to read: “ ... not more than ¼ inch...” -- that will allow the fabricator to use fillers up to and including ¼ inch thick plate, before having to request review and approval by the engineer.

Response: AASHTO requirements: with 1/4” or more there is reduction in bolt capacity of up to 20% that would require new calculation therefore we are not changing the verbiage.

No change made.

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Comment: (7-31-14)

**1. 460-4.2.2:** In general, the designers themselves make an effort to put the splices in low-stress zones already, and at a flange splice there is no compression area. Suggested revision to next-to-last paragraph: “Low-stress die stamp markings applied to fracture critical members shall be placed in locations or zones shown or described on the approved shop drawings. Low-stress or compression areas are preferred.”

Response: Accepted and changed.

Change made.

**2. 460-4.3.2.1:** Suggested revision to clarify that the normal heat-straightening, curving, cambering methods are not affected by this change: Add after 1st sentence: "Heat-shrink methods as described in 460-4.3.4 are also permitted."

Response: Added the following sentence under 460-4.3.2.2 after sentence one, “Heat-shrink methods as described in 460-4.3.4 are also permitted.”

Change made.

**3. 460-4.3.4.9.2:** Demonstration prior to application is appropriate, but opportunity to demonstrate to the Engineer is limited. This function should be delegated to the in-shop inspector. Suggested revision to the 2nd sentence: “Demonstrate the procedures to the Department’s inspector prior to preparations for painting.”

Response: This is not a revision of the verbiage, only a numbering change. Language was moved from 460-4.3.4.11.2 (which was deleted) and moved to 460-4.3.4.9.2. Not sure why this would be a problem now since the language has not changed.

No change made.

**4. 460-4.3.5.5:** Suggested revisions to clarify that normal CNC and other assembly provisions are not affected by this change:

4a. Add to 1st paragraph of 460-4.3.5.5: “Subpunched or subdrilled holes shall be at least 3/16" than the finished hole size.”

Response: Changed the 1st paragraph of 460-4.3.5.5 to read "Subpunched or subdrilled holes, when required, shall be at least 3/16" smaller than the finished hole size."  
Change made.

4b. Delete 2nd paragraph of 460-4.3.5.5.

Response: Agree.  
Change made.

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Comment: (7-31-14)

**460-6.1** - Aren't "qualified welders, qualified weld procedures, and qualified inspection personnel" covered in Section 105?

Response: Not necessarily. Section 105 does not call out for the use of the AWS codes.  
No change made.

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