AMERICAN ASSOCIATION
OF STATE HIGHWAY AND
TRANSPORTATION OFFICIALS
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ERRATA for
G2.2, Guidelines for Resolution of Steel Bridge Fabrication Errors,
2016 Edition

December 2016

Dear Customer:

Recently, we were made aware of some technical revisions that need to be applied to the *Guidelines for Resolution of Steel Bridge Fabrication Errors,* 2016 Edition.

Please scroll down to see the full erratum.

In the event that you need to download this file again, please download from AASHTO's online bookstore at:

http://downloads.transportation.org/NSBAGRSB-1-Errata.pdf

Then, please replace the existing pages with the corrected pages to ensure that your edition is both accurate and current.

AASHTO staff sincerely apologizes for any inconvenience to our readers.

Page	Existing Text	Corrected Text
9	**C.2.2** High strength bolted connections in steel bridges are often specified as slip-critical. In this type of connection, the prevention of slip in the service load range is the limit state. Since the load transfer mechanism is friction on the faying surfaces, the design assumption is that the slip resistance provided by the clamping force of each fastener is equal and additive with that at the other fasteners, provided the presumed areas of pressure transfer for the bolts do not overlap. See Figure C-3.1 in the RCSC specification. Slip resistance is also affected by the surface condition and hole size, so if any holes become oversize or slotted, the contribution by that bolt is reduced. Therefore, all locations must develop the slip force before a total joint slip can occur at that plane. However, although a slip-critical connection is designed to not slip into bearing under service loads, the connection must also meet the bearing requirements in an overload condition. This results in a final connection that does not slip under service loads, but also performs in bearing under extreme loads. It is only for the bearing load transfer mechanism that the hole spacing is treated as a direct design parameter. The bearing strength is a function of the hole spacing, so	[C2.2 was deleted, as it duplicated C2.1.]

	inadequate hole spacing reduces the total bearing strength. For the friction load transfer mechanism, the clamped areas of the plates in contact around each bolt must provide for friction load transfer. There must be enough room to correctly install the bolt.	
63	**C8.4** Weld-induced web distortion happens frequently on relatively thin webs, especially when the Fabricator uses high heat input tandem parallel SAW processes. The preferred technique to resolve this problem is the application of heat to the web. Sometimes corrections will result in distortion appearing in another panel section and it may take several attempts to correct the problem. AASHTO/AWS D1.5M/D1.5 is fairly lenient on the amount of web deflection (i.e., localized lateral bowing) allowed.	**C8.4** Weld-induced web distortion happens frequently on relatively thin webs, especially when the Fabricator uses high heat input tandem or parallel SAW processes. The preferred technique to resolve this problem is the application of heat to the web. Sometimes corrections will result in distortion appearing in another panel section and it may take several attempts to correct the problem. AASHTO/AWS D1.5M/D1.5 is fairly lenient on the amount of web deflection (i.e., localized lateral bowing) allowed. If "oil-canning" is observed or anticipated, it may be reduced on subsequent girders by changing the welding sequence (e.g., alternating sides to "balance" stresses), modifying the weld procedure (e.g., modifying preheat or adding post-heat), or determining whether smaller welds may be employed. Production workers should never apply heat to webs without controls or a firm plan, since distortions may increase or more serious defects may result.

2.2—HOLE TOO CLOSE TO FREE EDGE

Error:

A hole is drilled closer to the free edge than permitted by the applicable design specifications or drawings. A "free edge" is a rolled or thermally cut boundary not welded to another component. This includes the end or side edges of a flange, the end of a web, or any edge of a splice plate.

Repair Recommendation:

1. If the hole is adjacent to a TCE and bolt placement is based on criteria from the AASHTO *Standard Specifications for Highway Bridges*, for errors up to ⅛" [3 mm], grind the adjacent edge of the plate to approximate a planed finish and allow a smaller clearance than for a TCE.

2. For errors reducing clearance below AASHTO specified minimums but not breaking the edge, determine whether the contribution of the bolt to the connection's total capacity can be neglected.

    a. If so, the connection may be used as is, but a bolt must still be inserted in the errant hole to address fatigue concerns, maintain the sealing pitch, and avoid confusion on future inspections.
    b. If neglecting the bolt makes the connection inadequate, follow Repair Recommendation 3 in Section 2.1, "Too Close to Adjacent Hole."

3. If the mislocated hole breaks through the edge of one element in the connection, it cannot be ignored, even if the connection has adequate strength without it. If only a very small portion of the hole encroaches into the material, consider grinding 1:10 tapers to the surface if the remaining material will be adequate.

If penetration is significant (more than ½ hole diameter or remaining material will not be adequate), the material must be replaced or repaired. If this

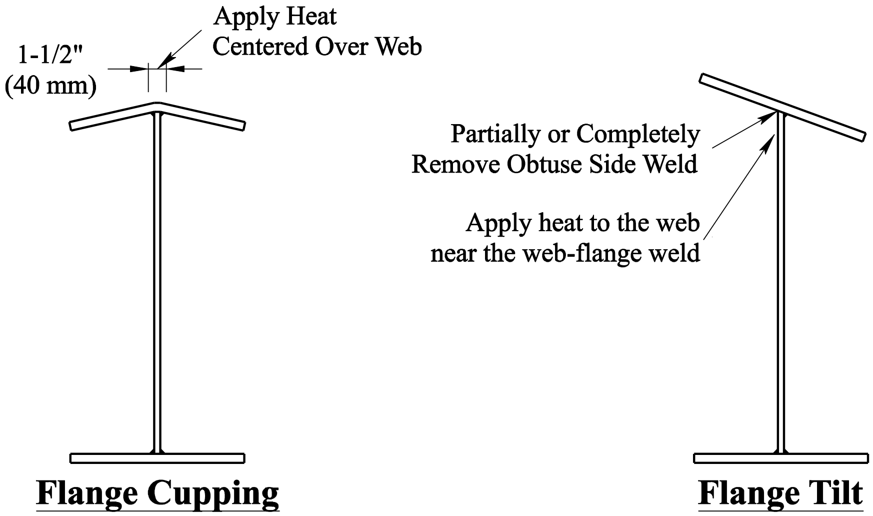

Figure 8.3-1—Flange Cupping and Tilt (shown exaggerated)

8.4—CORRECTING WEB DISTORTION

Error:

Web distortion such as waviness in as-received plate and weld-induced deviations such as "oil-canning" requires correction either because the distortion is beyond the variations from flatness permitted by applicable specifications, or because it prevents assembly of adjoining elements.

Repair Recommendation:

"Oil-canning" is caused by weld shrinkage around the perimeter of a web "panel," bounded by the flanges and interior stiffeners or connection plates, and depends on the web thickness, welding sequence, and panel dimensions. It is common for thin (less than ½" [12 mm] thick) webs, especially if $^{5}/_{16}$" [8 mm] and larger welds are used. Although unsightly, "oil-canning" alone does not usually cause deviations exceeding those allowed by AASHTO/AWS D1.5M/D1.5. If tolerances are exceeded, usually with webs less than $^{7}/_{16}$" [11 mm] thick or when combined with existing waviness, bringing correction requires judicious use of mechanical methods, heat patterns and/or welding or bolting vertical stiffeners to the member. If possible, the web is moved back before attaching the stiffeners, usually to the concave side of the web for welded and to both or just the convex side for bolted. The added stiffeners are to correct web distortion and prevent buckling, so single stiffeners should be connected to the compression flange and pairs sandwiching the

C8.4

Weld-induced web distortion happens frequently on relatively thin webs, especially when the Fabricator uses high heat input tandem or parallel SAW processes.

The preferred technique to resolve this problem is the application of heat to the web. Sometimes corrections will result in distortion appearing in another panel section and it may take several attempts to correct the problem. AASHTO/AWS D1.5M/D1.5 is fairly lenient on the amount of web deflection (i.e., localized lateral bowing) allowed.

If "oil-canning" is observed or anticipated, it may be reduced on subsequent girders by changing the welding sequence (e.g., alternating sides to "balance" stresses), modifying the weld procedure (e.g., modifying preheat or adding post-heat), or determining whether smaller welds may be employed. Production workers should never apply heat to webs without controls or a firm plan, since distortions may increase or more serious defects may result.