

**Sent:** Tuesday, January 13, 2015 12:08 PM

**To:** AISC Solutions

**Subject:** Possible Technical Errors in Design Guide 15, Historic Shapes and Specifications

Design Guide 15 indicates that certain AISC allowable stresses changed little or not at all during the early 1940s. I submit that this is not accurate and will explain why there were changes and that these changes are relevant today.

The United States entered World War II in December 1941. Structural steel was in short supply because of military and war industry needs. To manage this situation the Federal Government created several agencies including the "War Production Board". AISC participated in the war effort by preparing revised "National Emergency Specifications for Design, Fabrication and Erection of Structural Steel for Buildings". The document was issued for use in September 1942. The Specification is available on the AISC website. A higher quality scan is available here:

<https://archive.org/details/WarProtectionBoardNationalEmergencySpecificationsForTheDesign>

Basic allowable stresses for structural members, rivets, A307 bolts, and welds were increased. This was done to minimize the amount of structural steel and connectors needed for a building. Please note that the specification prohibits use of the previous lower stresses (see Part IV, Section 10, on page 12 of the specification).

The War Production Board cover letter states that the specification applies to "all buildings which are constructed... financed... or approved by" various government departments or agencies. By today's standards that sounds like the specification applies ONLY to government contracts. However, the shortage of steel during World War II dictated that virtually ALL construction using structural steel had to have government approval to be allocated steel. I submit that if a building from this time exists today; it was designed, fabricated and constructed using the 1942 specification.

World War II ended in 1945. In 1946, AISC issued a replacement specification that returned many allowable stresses to lower proven values. The following Design Guide 15 tables do not show or mention the 1942 allowable stress changes discussed above:

Table 1.1.b Historical Basic Allowable Stresses (ksi) in AISC Specifications

Table 1.3.b Historical AISC Allowable Stresses (ksi) for Rivets – ASD

Table 1.4.1.a Historical AISC Allowable Stresses (ksi) for... A307 Bolts – ASD

Table 1.5.a Historical AISC Allowable Stresses (ksi) for Welds – ASD

Proposed revisions to these tables are attached.

I consider Design Guide 15 to be the authority on historical member sizes and allowable design stresses. When modifying a building from this time period it is often necessary to back-figure the original design loads based on beam sizes, dimensions, connectors and allowable stresses at the time. From 1942 to 1946 loads are actually at least 20% higher than information from Design Guide 15 will indicate.

Sincerely,

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AISC Member