

PREFACE

Supplement 3 includes the following revisions with changes/additions in Supplements 1 and 2 incorporated:

Section A1.2, Applicability. Subsection numbering A1.2.1 through A1.2.9 is added. Subsections A1.2.8 and A1.2.9 are newly added to address any conflicts, if exist, between the *Specification* and the *applicable building code*.

Section A1.3, Definitions. Two new term definitions are added.

Section A2, Referenced Specification, Codes and Standards. References were updated in 2020. Two new ASTM standards and four SAE standards are added.

Sections A3.1.1, A3.1.2 and A3.1.3. The applicable ASTM standards listed in these sections are provided in table format. In Section A3.1.3, the *tensile strength*, F_w under item (c) is revised to 80 percent of specified minimum *tensile strength* or 65 ksi (448 MPa).

Section A3.2.1, Ductility Requirements of Other Steels. Item (c) is added for determining uniform and local elongation.

Section A3.3.2, Strength Increase From Cold Work of Forming. The requirement that no distortional buckling should take place in a member in considering cold work of forming has been removed.

Section B4.1, Limitations for Use of the Effective Width or the Direct Strength Method. The limitations are clarified by separating shear and *web crippling* limits from *local* and *distortional buckling* limits.

Section C2.2, Bracing of Beams. The required brace force is permitted to be determined by a *second-order analysis*. The section also clarifies the situations where bracing to beams is not required.

Section C2.2.2, Flange Connected to Sheathing That Contributes to the Strength and Stability of the C- or Z-Section. The section clarifies the appropriate *Specification* sections to be used in determining the bracing and anchorage of purlin roof systems.

Section C2.3, Bracing of Axially Loaded Compression Members. Provisions are added for determining the translational bracing of multiple parallel concentrically loaded compression members.

Chapter E, Members in Compression. The contents of this chapter are reorganized so that only those provisions for determining the axial strengths are included. Provisions related to determining *elastic buckling* forces are moved to the appropriate subsections under Section 2.3 of Appendix 2.

Chapter F, Members in Flexure. The contents of this chapter are reorganized so that only those provisions for determining the flexural strengths are included. Provisions related to determining *elastic buckling* moments are moved to the appropriate subsections under Section 2.3 of Appendix 2. In addition, *DSM distortional buckling* strength prediction are expanded to U-, Hat, panels or similar cross-section members.

Chapter G, Members in Shear, Web Crippling, and Torsion. The bearing stiffener design provisions are moved from Section F5 to Section G7. Torsion design provisions are added to Section G8.

Section G2.1, Flexural Members Without Transverse Web Stiffeners. The strength prediction equations were revised.

Section G2.2 Flexural Members With Transverse Web Stiffeners. The requirements for *web* transverse stiffeners are clarified.

Section G3, Shear Strength of C-Section Webs With Holes. The revised provisions provide a better strength prediction and a wider application range.

Section G7, Bearing Stiffeners. This section is relocated from Section F5. Eq. G7.2-1 is revised to be applicable to the *Direct Strength Method*.

Section G8, Torsion Strength. This newly added section provides design provisions for determining the *available bimoment strength*. The section is applicable for general cold-formed steel sections subjected to longitudinal torsion *stresses*.

Section H1.2, Combined Compressive Axial Load and Bending. Provisions for singly-symmetric unstiffened angle cross-sections with holes were reverted to those in the 2012 edition of the *Specification*.

Section H4, Combined Bending and Torsion. The stress-based provisions were changed to an interaction equation, which considers biaxial bending and bimoment.

Section I1.2, Compression Members Composed of Multiple Cold-Formed Steel Members. The design provisions in this section are generalized and are now applicable for composite sections formed by multiple members.

Sections I4, I5, and I7. References to AISI S240, S400 and MH16.3 were removed in the main body of the *Specification*.

Section J2, Welded Connections. The *safety* and *resistance factors* in this section and the subsections are recalibrated. Section J2.5, Arc Plug Welds, is newly added.

Section J3, Bolted Connections. The applications of SAE bolts are now permitted.

Section J4, Screw Connections. The *safety* and *resistance factors* in this section are recalibrated. For double shear connection, the bearing strength can be determined directly from newly added Section J4.3.2.

Section J6.3, Block Shear Rupture. The design provisions are revised based on new research that provides a better strength prediction.

Section J7.2, Power-Actuated Fasteners (PAFs) in Concrete. This section has been deleted.

Section K1, Test Standards. The test standards referenced in Section K1 are updated.

Table K2.1.1-1, Statistical Data for the Determination of Resistance Factor. The entry for “Shear Strength Limited by Titling and Bearing” (which was in the 2012 Edition of the *Specification*) is added back.

Section 2.3, Analytical Solutions. This section and its subsections are reorganized, and new contents are added:

- All the expressions for determining the elastic *buckling* forces and moments are provided in this section.
- New expressions are added to determine the global buckling forces for members with a non-symmetric cross-section.
- New expressions are added to determine the *distortional buckling* moment when the cross-section is bending about the axis parallel to the web.