### A. Secciones permanentes

#### 1. Steel Intercharge

A collection of technical questions and answers on steel design, fabrication and construction

**Opinión como lector.**- Reto para AISC organizarlo para que sea más útil. También como un TEG. ¿Por año de las normas AISC?

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**Steel Interchange**

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Steel Interchange

This is the start of a new monthly column to discuss questions regarding structural steel design, fabrication and erection. Steel Interchange is an open forum for Modern Steel Construction readers to exchange useful and practical professional ideas and information on all phases of steel building and bridge construction. Opinions and suggestions are welcome on any subject covered in this magazine. If you have a question or problem that your fellow readers might help to solve, please forward it to Modern Steel Construction. At the same time feel free to respond to any of the questions that you have read here. Please send them to: Steel Interchange, Modern Steel Construction, One East Wacker Dr., Suite 3100, Chicago, IL 60601-2001.

Answers and/or questions should be typewritten and double spaced. Submittals that have been prepared by word-processing are appreciated on computer diskette (either as a wordperfect file or in ASCII format).

The opinions expressed in Steel Interchange do not necessarily represent an official position of the American Institute of Steel Construction, Inc. It is recognized that the design of structures is within the scope and expertise of a competent licensed structural engineer, architect or other licensed professional for the application of principles to a particular structure.

Information on ordering AISC publications mentioned in this article can be obtained by calling AISC at 312/670-2400 ext. 433.

How can one get the out-of-date design specifications and properties and dimensions of structural steel shapes that are not currently being produced?


However, as the infrastructure ages and our buildings and bridges need renovation or retrofitting, they often have to be evaluated and, if necessary, strengthened to meet the current needs. And many of these structures were built with steel shapes and grades that are not produced today. The AISC book, Iron and Steel Beams 1873 - 1952 (AISC Publication No. M003) aims at helping engineers and architects to solve the problems that this question raises.

This book includes all of the properties and dimensions required for design of shapes that were produced in the U.S. between 1873 and 1952. In addition to providing design properties of the shapes, the book also contains a section that summarizes the history of the materials standards that were used. The data includes the tensile and yield strength requirements for the steels that were commonly used for bridges and buildings.

Iron and Steel Beams 1873 - 1952 does not contain any of the structural steel design specifications that were in effect throughout this period. Part of the reason for this is the lack of standardization prior to the organization of AISC in 1921. A great many different specifications were in use in the early 20th century: some of these had been developed by various municipalities or cities; others had been prepared by steel or construction companies. There are even instances where designers developed individual, unique design standards for major structures. However, appropriate working stress recommendations that were utilized at the time are shown in this book.

There is consequently no need to find, much less purchase a specification that is out of print. You must, though, take into account the properties of the actual steel that was used, including the very important chemical and metallurgical characteristics, as well as the production method itself. For example, if the structure in question is a bridge that was originally built in 1918, the steel is most likely ASTM A7. This material had a tensile strength between 55 and 75 ksi, and a specified minimum yield stress of 30 ksi. In addition, a laboratory evaluation of a coupon specimen from the steel is desirable, if possible. The loading and design criteria of the present-day building code can then be used along with the identified material properties to assess the adequacy of the structure.

However, it is also essential to consider the chemical composition of the steel; it is not uncommon to find that some of the older materials had relatively large amounts of agents such as sulphur and phosphorus. This composition may result in a relatively high carbon equivalent, which could make welding difficult.

(Recent AISC Engineering Journal's have included several articles on reinforcing existing structures that are of great use to engineers working on renovations.)

Modern Steel Construction / March 1992
March 2015, maximum spacing and edge, concrete encased column

February 2015 Prying action, continuous gusset

January 2015 OMF truss System, Expansion joint, web opening in plate girder

December 2014 Eccentricity coped beams, splices in bent edge plate, bolt entering direction

September 2014 weld designation, DTI prequalified, comparing AISC 360 chapter J Append. 3 Requirements

August 2014 beam column restrained at one flange, base plate washers, fillet weld Limitations. Buckling column weak axis, tension bolted with multiple lines of bolts, large diameters bolts

July 2014 A36 plate with Fy grade 50, distortion of Moment Pend plate, pretensioned bolts of end plate

April 2014 Plate girders stiffeners, Lateral torsional Buckling of bars, fixity truss web members

March 2014 stability of beams during erection, prequalified connections strength anchor rod, Shear lag, reinforcing fillet over CJP

February 2014 Special inspection, capacity of existing welds, filling weld access hole thermal couting, group A y B bolts, Stability and ELM

January 2014, plate bending, eccentricity bolts, K area, base plate shear transfer

December 2013 Método de análisis directo

November 2013 end plate design. SFRS base design vertical welding, collector design, Bolt design strength

March 2013 double angle compression, OCBF work point,

June 2013 Tension only OCBF, single sided fillet weld, Load reversed Shear stud, SCBF Brace slender, single angel connection

January 2013 Tolerance of punches holes, k area, blast cleaning and slip connection

April 2013 Importance dynamics properties, inelastic response

March 2013, free edge buckling gusset plates,
February 2013 P delta effect, Beam column design, Prying action in end plate, Flange bending, slips joint with fills, diagonal bracing connection

August 2012 Eccentrically load single angle, reusing bolts, CJP Groove welded Flange, slender web flexure, bolted connection ductility, bent plate

September 2011 OCBF unbalanced load. Multiple washers, sloted hole,

August 2011 Fillet weld design, design of bracing connection, beam bracing, preinstallation verifying. Proper nut orientation

June 2011 Bolting cost, IMF Panel zone, change delegate connection, fillet welded skewed plate

Sept 2010 CBRF

August 2010 BF in table B3.2 Member splice, torch couting, tension control bolts, beam column orientation. Snug thigned connection

July 2010 Restrained beam, doble angle compression peak stresses, A 307 bolts, Maximum bolt tension

May 2010 Damaged column, stiffening torsion, Lateral bracing cantilever, minimum composite shear connection

March 2010 Connection filler plate, bolted connection for seismic

October 2009 second order analysis, panel zone shear strength, single plate shear connection, nut type anchor SCBF X brace. Fillers, bolt hole size

Sept 2009 anchor rod, fillet weld size, prequalified weld, installation torque

June 2009 Stiffeners for EBF, Tensile strength anchor bolt, puching shear shear lag factor rotational restraint support, bolting seismic application

May 2009 ASTM A449, w/d ratio, weak axis flexure plate, thickness for single plate shear

November 2008, Effective length of vertical brace, end reactions, single angle in flexural, extended single plate connection

October 2008 Slip critical bolts, Charpy V notch, Flare Bever Groove welds, block shear strength,

September 2008 KL/r for single angle, fillet weld strength
January 2008  Washers for rod installation, KL/R modified for single angle, butt splicing beams, suspension spinkle load,

July 2007 Base anchorage seismic zone, backing bar removal, Monet of group bolts.

Febrero 2007  Braced Frame seismic connection

April 2003, Finger shims in bolted joist, seismic design double plate, prying action of tees and doble angle, backing bars for CJP grove welds

March 2003 OCBS in low buildings, OMFT under flexure,

Feb 2003 Net area calculation, Whitmore section. Seismic column splices

January 2003 bolt holt sizes, Tees under flexure,

August 2002 Built up shapes, shear capacity of bolts, workable gages, anchor roda

June 2002 Seismic design of base plates, restrained condition, shear lag

May 1998, composite beam, continuum steel truss

2. Steelwise

March 2015  Connection design responsibility. How s it been goin?

December 2014 The right connection

December 2014 Constitucion mixta

October 2014 Stability bracing

June 2014 Design Guide 13 Wide Flange Column stiffener

February 2014 Tips to take your team to the top´

January 2014 Reinforcing the point

December 2013 K factor

August 2012 Bent plate

July 2010 Horizontal bracing

January 2009 Are you properly specifying materials?
Opinión como lector.- Reto para AISC organizarlo para que sea más útil. También como un TEG. ¿Por año de las normas AISC?

3. OTRAS SECCIONES DE MSC

August 2009 existing bracing connection, Beam bracing, single plate shear

April 2000 Economy in Steel

December 1999 Lower flange under hung crane

CB cantilevers
3. Steel Quiz

Pendiente completar con registros mas antiguos

This month's Steel Quiz takes a look at end-plate moment connection design as covered in AISC Design Guide 16: Flash and Extended Moment End-Plate Connections, by Thomas M. Murray and W. Lee Shoemaker (www.aisc.org/designguides).

1. A flush endplate moment connection is typically used:
   a. In frames subject to light internal loads
   b. Near inflection points of girders frames
   c. At beam-to-column moment connections
   d. a and c

2. True or False: Endplate moment connections discussed in Design Guide 16 have adequate moment rotation stiffness to be classified as a fully restrained (FR) moment connection.

3. True or False: ASTM A325 bolts in endplate moment connections not subjected to fatigue or high-velocity loading can be installed in the stress-relief condition.

4. True or False: Weld access holes are required for the flange-to-end-plate welds for extended endplate moment connections subject to high-velocity loading.

5. In Equation 2-7, taken from Design Guide 16, the 1.11 factor:
   a. Accounts for the variability in the yield strength of the end plate
   b. Accounts for residual stresses in the end plate due to welding
   c. Is an additional safety factor to account for simplify the end plate design procedure
   d. Ensures the plate behavior and not yielding action

6. In Equation 2-7, taken from Design Guide 16, the y factor:
   a. Ensures that a flush end plate qualifies as a fully restrained (FR) connection
   b. Is a yield line accommodation factor to account for extended endplate configuration

7. True or False: When pre-tensioned or stress-relief bearing (FR) endplate moment connections are used, it is common practice to assume that the compression force acts at the end of the shear force.

8. When the applied moment is less than the design flexural strength of the beam, the beam flange to endplate weld can be designed for the required flexural strength but not less than ________ of the specified minimum yield strength of the connected beam flange.
   a. 0.50
   b. 0.75
   c. 0.40
   d. 0.60

9. True or False: For beam shear resistance, the authors of Design Guide 16 recommend using the full depth of the beam web.

10. Stress bolts between the tension and compression flanges are sometimes used in deep end-plate moment connections:
    a. Meet OSHA safety requirements
    b. Reduce plate separation caused by welding distortions
    c. Increase the overall connection stiffness, meet the requirements in Section B.6 of the AISC Specification
    d. Provide additional bolts just in case some bolts can't be installed due to field issues

TURN PAGE FOR ANSWERS
Steel Quiz

Steel Quiz made its first appearance in the November 1999 issue of Modern Steel Construction. This month's Quiz takes a look at some of the best questions from 1999.

1. ASTM A325 and A490 provisions include thread dimensions that are larger than those for other bolt grades. Why?
2. What is the fillet size shown in Figure 1? Depicted as A or B or C or D?
3. When steel is specified to be painted without indication of required surface preparation method, what surface preparation is used?
4. An ASTM A325 bolt is subjected to a tension load that is gradually increased until failure. Which of the following descriptions best describes the failed bolt?
   a. The threads have stripped, causing the bolt and nut to separate.
   b. The unthreaded bolt shank is undamaged and fractured near its midlength.
   c. The threaded portion of the shank between the nut and the head is elongated and fractured.
   d. The unthreaded bolt shank is fractured near the junction of the bolt head and shank.
5. A welder is observed and is not wearing a welding helmet. Which of the following welding processes is most likely being used?
   a. Flux-cored arc welding (FCAW)
   b. Submerged arc welding (Saw)
   c. Steel inert gas welding (SMAW)
   d. Shielded metal arc welding (SMAW)
   e. None of the above
6. Name three methods for setting a column base to proper elevation.
7. The air pressure in the ASC Specification: beams and column connections are designed to have equivalent reliability.
8. Give two examples of common structural designs that have both unconfined elements and confined elements, and c. only confined elements.
9. In interior moment frame designs, a strong-column/weak-beam design requirement is sometimes imposed. What does this mean?
10. There are at least six methods that are used to cut steel. How many can you name?

Turn page for Answers.