

by Ryan J. Dexter, P.E.

### The right tools for the job

Nearly eight years ago *SBC Magazine* published an article referencing the top ten books all technical departments should own (see December 2003 issue). It's amazing how the digital age has revolutionized publishing; most publications now offer digitally searchable copies of these technical resources. While some of us "old school" folks still like to reach for a real book off the shelf, digital reference materials may be an economical option for companies with users at many different offices. Similar to the 2003 article, the following expanded list of 15 resources includes a brief description of each reference along with ordering information.

### Top 15 Technical Library Resources

**1. Building Codes:** You want to make sure your designs conform to the building code in the project's jurisdiction. The International Building Code (IBC) and International Residential Code (IRC) provide the minimum guidelines for the design, analysis, and construction of commercial and residential buildings. Most jurisdictions adopt the IBC and IRC with few changes. They generally post codes or amendments online depending on public compliance needs. When in doubt, contact your local building department. The IBC and IRC identify numerous other documents and standards which may become part of the code by reference (IBC Section 102.4 / IRC Section R102.4).<sup>1</sup> The IBC and IRC are available from the International Codes Council ([www.iccsafe.org](http://www.iccsafe.org)).

The following structural building component industry standards and documents round out our top 15 references.<sup>2</sup> The resources listed are the editions referenced by the 2009 codes. SBCA believes that it is best to use the latest standard/code requirements when designing a structure, as they include changes based on the most current research. So you may want to check to see that your department has the most up-to-date versions of these resources as you read. However, designing a structure to an older version of a code or standard generally will provide a sufficient degree of safety. Ultimately, the editions of the codes and standards that are used on a given project are up to the authority having jurisdiction to decide.<sup>3</sup>

**2. SBCA Load Guide Version 1.03: Guide to Good Practice For Specifying & Applying Loads to Structural Building Components:** The SBCA Load Guide is a resource to help users more easily understand, define and specify design loads applied to structural building components. This load calculation tool is used by a very wide variety of professionals: building designers, code officials, truss designers and truss technicians. Free download available at: [www.sbcindustry.com/loads.php](http://www.sbcindustry.com/loads.php).

**3. ASCE/SEI 7-05 Minimum Design Loads for Buildings and Other Structures:** This document describes the loading requirements for live, dead, and environmental loads. Sections of this document are included in the IBC. SBCA's Truss Technician Training (TTT) Level II online course spends quite a bit of time reviewing these loading procedures. This is available from the American Society of Civil Engineers (ASCE) ([www.pubs.asce.org](http://www.pubs.asce.org)). References to ASCE 7 are throughout SBCA's Load Guide as well.

**4. Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood**

**Trusses:** Produced by the Truss Plate Institute (TPI) and SBCA's Wood Truss Council (WTCA), BCSI is the wood truss industry's guide for jobsite safety and truss performance. For details visit: [www.sbcindustry.com/bcsi.php](http://www.sbcindustry.com/bcsi.php).

**5. Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing, Restraining & Bracing of Cold-Formed Steel Trusses:** SBCA's Cold-Formed Steel Council (CFSC) has developed a similar guide for cold-formed steel trusses (CFSBCSI). All are available from CFSC: [www.cfsc.sbcindustry.com/cfsbcsi.php](http://www.cfsc.sbcindustry.com/cfsbcsi.php).

**6. Metal Plate Connected Wood Truss Handbook:** This is the only textbook on the market written specifically for the truss industry. In its third edition, the handbook contains loads of information on all aspects of truss design, manufacturing, installation details and bracing. It is a tremendous resource for any technical department. You can order online from SBCA: [www.sbcindustry.com/pubs/HB3-D](http://www.sbcindustry.com/pubs/HB3-D).

**7. AISI Documents: 2007 North American Specification for the Design of Cold-Formed Steel Structural Members (S100), S200-07 North American Standard for Cold-Formed Steel Framing – General Provisions, and S214-07 North American Standard for Cold-formed Steel Framing – Truss Design:** If you design and manufacture cold-formed steel trusses, these are your main resources. The design of cold-formed steel trusses for load carrying purposes in buildings is done in accordance with S100 and S200, except as modified by the provisions of S214. S214 also applies to manufacturing, quality criteria, installation and testing as they relate to the design of cold-formed steel trusses. All AISI documents are available through the Steel Framing Alliance (SFA) and the Cold-Formed Steel Engineers Institute (CFSEI): [store.steel framingalliance.com](http://store.steel framingalliance.com).



### Readers Respond

Dear SBC,

I'd like to make a few comments regarding your Technical Q&A column in the March issue regarding trusses used in corrosive environments.

In response to the writer's question regarding metal plate connected trusses used in a salt storage building, you indicated that if the building has free-flowing air there are no precautionary measures that would need to be taken to protect the metal connector plates. Our experience at ITWBCG has been that connector plates in salt storage and fertilizer storage facilities susceptible to condensation are at risk of corrosion. The presence of moisture in the form of condensation results in the salt and fertilizer dust on the connector plates going into solution and this creates the mechanism for corrosion.

Air flow, whether sufficient or insufficient, has not been found to be a factor in deterring corrosion in these types of structures. The dust finds a way onto the plates and thus creates the potential for corrosion. We have always recommended the TPI-prescribed paint coatings for these types of storage facilities.

You define hot dip galvanization as the process of adding an additional coating of zinc to a metal connector plate. Hot dip galvanization is actually the process by which the zinc coating is applied to the sheet steel before the steel is shipped to a plate stamping facility. The sheet steel is fed through a zinc bath, allowed to cool, and then coiled up for shipment. Re-galvanizing takes place after the connector plates have been stamped. The stamped plates are sent out to a facility that handles re-galvanization. The original zinc coating is stripped off the connector plates and then a new, heavier zinc coating is applied.

Typically connector plates are re-galvanized with an excess of 2 ounces of zinc per square foot of plate surface, compared to the original 0.60 ounces per square foot (G60) on the sheet steel when it is shipped to the stamping plant. Except for zinc-rich paint coatings, I am not aware of any process that applies an additional layer of zinc to a metal connector plate on top of the original G60 coating that was present on the plate at the time of stamping without first stripping off the original G60 zinc coating.

Bruce Feldmann, P.E. • Chief Engineer – Earth City • ITW Building Components Group, Inc.

<sup>1</sup> 2009 IBC 102.4 / 2009 IRC R102.4 Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

<sup>2</sup> The following standards/documents are specifically referenced by the IBC/IRC for inclusion in the code: AISI documents, ASCE 7, BCSI, NDS, SDPWS, TPI 1 and WFCM.

<sup>3</sup> SBCA Load Guide Version 1.03: Guide to Good Practice For Specifying & Applying Loads to Structural Building Components ([www.sbcindustry.com/loads.php](http://www.sbcindustry.com/loads.php)).

### at a glance

- Every component design department should have a small reference library of important technical documents.
- It is generally best to make sure your designs conform with the most current versions of the IBC and IRC.
- However, building code adoption is at the discretion of the authority having jurisdiction.

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## Technical Q&A

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### 8. ANSI/TPI 1-2007 National Design Standard for Metal Plate Connected

**Wood Trusses:** If you design and manufacture wood trusses in the U.S, this is your main resource. The truss design software you use is also based on it. TPI 1 also contains the industry's standard design responsibilities and in-plant quality control requirements. Individually available from the Truss Plate Institute ([www.tpinst.org](http://www.tpinst.org)) or order the Metal Plate Connected Wood Truss Handbook (see suggested resource 6) and TPI 1 together in a hard copy or digital package from SBCA ([www.sbcindustry.com/pubs/HB3-ED+ANSI](http://www.sbcindustry.com/pubs/HB3-ED+ANSI)).

### 9. NDS-05 National Design Specification (NDS) for Wood Construction-with

**2005 Supplement:** The NDS provides design values and equations for engineering a variety of wood products and metal fasteners. Many of TPI 1's design principles are derived from the NDS since trusses are a specialized case of lumber and fastener engineering. NDS is available from the American Wood Council ([www.awc.org](http://www.awc.org)).

### 10. ANSI/AF&PA SDPWS-08 Special Design Provisions for Wind and

**Seismic:** Also from the American Wood Council, SDPWS covers materials, design, and construction of wood members, fasteners, and assemblies to resist wind and seismic forces ([www.awc.org](http://www.awc.org)).

### 11. WFCM-08 Wood Frame Construction Manual for One- and Two-Family

**Dwellings:** The WFCM provides engineered and prescriptive requirements for wood frame residential construction based on dead, live, snow, seismic and wind loads derived from the IBC. Also published by the American Wood Council ([www.awc.org](http://www.awc.org)).

### 12. Truss Connector Catalog:

Make sure this is the most up-to-date version available. Most connector companies update these annually and have them online. Read the fine print and make sure your technical department understands the fastener capacities and what load duration factors they are based upon.

### 13. Timber Construction Manual:

This is "the handbook for heavy timber design." It includes technical data for dimension lumber, timbers and glued laminated timber and current timber design methods for beams, columns, arches and timber trusses. Another useful feature is the capacity tables for simple span beams up to 40'. Available from the American Institute of Timber Construction ([www.aitc-glulam.org](http://www.aitc-glulam.org)).

### 14. Lumber Guides and Span Charts for Dimensional Lumber and

**Engineered Wood Products:** These are important when structures mix conventional and component construction. The guides contain span charts, strength properties, adjustment factors and installation details that every designer needs to consider. Most of these are available online. The four primary organizations to contact for wood: the American Wood Council ([www.awc.org](http://www.awc.org)), Canadian Wood Council ([www.cwc.ca](http://www.cwc.ca)), Southern Pine Council ([www.southernpine.com](http://www.southernpine.com)), and Western Wood Products Association ([www.wwpa.org](http://www.wwpa.org)). For EWP guides, contact the specific manufacturer.

### 15. SBCRI's Roadmap to Code Compliance:

It is important for your technical department to understand how products comply or can comply with the building code. Through Technical Evaluation Reports (TER), the Structural Building Component Research Institute (SBCRI) has provided a roadmap for product code compliance: [www.sbcrici.info/codecompliance.php](http://www.sbcrici.info/codecompliance.php). **SBC**

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