

The AISC Committee on Manuals and Textbooks began the effort of overhauling the AISC manual three years ago. From the onset of the project, the committee sought to return the text to its origins as a true handbook for practicing structural engineers. In line with this approach, users of the new manual will notice that design examples have been removed from the text and instead will be expanded upon and improved in a companion CD-ROM titled *Design Examples*. This month's SpecWise articles will address both the AISC manual and AISC *Design Examples*.

New and Improved

The 13th Edition *Steel Construction Manual* is the one that you've been waiting for.

By Christopher Hewitt

What color is your manual? Is it green? Or blue? Or is it red? Maroon? Silver? What about orange? All engineers know what color their manual was when they first learned steel design. All of us have a green book and probably a blue book or a silver book at our disposal. It's likely that somewhere around your office, someone has a red book, too. The color of your steel manual says a lot about you—about your tenure, your history, and your preferred design method.

AISC's new 13th Edition *Steel Construction Manual* was designed to unify the profession with one approach to steel design, so it seems only appropriate that we embrace all the colors of our history by bringing the best parts of our past into the present. ASD and LRFD have been combined into a single design method, and to represent that approach, the color chosen for the new manual is the perfect combination of all the colors of the artist's palette—black.

Inside the new manual, color plays a crucial role. Strength values for ASD

are identified with green shading, while strength values for LRFD are printed in blue. Design and detailing values applicable to both ASD and LRFD are presented in black text, making the application of the *Manual's* design aids intuitively obvious.

Something New

Users of both the 1989 ASD manual and the 2001 LRFD manual will notice a number of technical improvements to this edition. Among them is a new design aid with tabulated values for the critical stress of compression members to allow for simple application of the 2005 specification Chapter E compressive strength provisions. A new table has been added for the corrosion compatibility of dissimilar metals to assist designers in making connections to façade systems and building services. Design curves for shear stress in plate girders have been developed to replace a tabular representation of this information in previous versions of the AISC specification. And a simplified method for considering second order effects has been developed for the *Manual*.

Because the *Manual* has always been intended to give designers a simplified and direct means of applying the AISC specification to the design process, the shapes listing and design aids of the *Manual* now include descriptive and intuitive footnotes to highlight when special design considerations must be taken into account. This simplifies the application of the *Specification*, which separates provisions for member design based on the limiting width to thickness ratios of elements in the section. For instance, if a shape is designated with a superscript "c" (for example, W10×22^c), the designer

is immediately made aware that the shape contains slender elements when in compression. To simplify the application of design provisions, a designer can select compression members that do not have footnotes.

Totally Tubular

Material on HSS connections is now contained in the *Steel Construction Manual*, further unifying the references that steel designers use. The HSS material includes guidelines for shear connections, as well as tabulated dimensions for the workable flat dimension of rectangular and square HSS. This material will give designers a reasonable method for determining the width of HSS walls available for making connections to the members. Design properties of pipe (ASTM A53) have also been modified to incorporate the 7% reduction on the wall thickness that has historically been used in calculating the design properties of HSS (ASTM A500) members to account for the common practice by HSS manufacturers to downgrade their pipe product and supply it as meeting the requirements of ASTM A53 without a pressure test.

Nuts and Bolts

A number of improvements have been made in the connection design recommendations of the *Manual*. Simple shear connections now include a simplified design procedure for single-plate shear connections and a design procedure for the design of extended single-plate shear connections. Likewise, end-plate moment connection design procedures have been modified to reflect current design methods.

A direct calculation method has been added for determining the buckling



