

Evolution's Next Step

BY TABITHA S. STINE, P.E., LEED AP

Welcome to AISC's new and expanded steelTOOLS—now with social/professional networking.

STRUCTURAL ENGINEERING CAN JUSTLY be described as a “tried and true” profession. Although innovation does occur regularly in our profession, the basic fundamentals of structural engineering are rooted deep in our history. Prior to advanced computer programs, nearly all analysis was done by hand. Still today, traditional methods are used frequently for back-of-the-napkin calculations and

have developed entire suites of design spreadsheets to streamline their daily work. For example, you or your co-worker may have a spreadsheet for wind load calculations, another for base plate design, and a macro for estimating beam sizes. Some of these tools are based on lessons learned in practice, current material availability, or fabrication allowances and tolerances that commercial software doesn't account for. Even as software capabilities continue to expand, these shortcut tools will continue to play a vital role in the design process.



for checking software output. Advancements in technology have allowed us to do more sophisticated analysis to account for second order effects and complex lateral load systems. Efficiency with design speed also has improved, especially when analyzing and designing large structures with a high number of load combinations. The core concepts of structural engineering have not changed, but the tools we use to perform the work have vastly improved over time. The resulting faster and safer designs have enabled engineers to meet the schedule demands of the commercial and infrastructure boom over the last 50 years.

Commercially available software has made a profound impact on the design and detailing of nearly every notable structure in the United States today. However, shortcut spreadsheets and macros—designed to streamline calculations and perform tasks outside of the software's limitations—also have served an important role in optimizing the designs of those same structures. Many structural engineers and detailers alike

Recognizing the importance of design aids, several years ago AISC developed Steel Tools, a series of automated calculators that helped designers arrive at an optimal solution quickly and easily for a wide variety of design challenges such as initial beam and column sizing. An engineer could download a Steel Tool from the AISC website (for free) and use it in his/her daily work as an alternative to back-of-the-napkin calculations, especially dur-

*Tabitha Stine is AISC's director of technical marketing. She encourages all MSC readers to participate in the steelTOOLS website. Please logon to the site, and become her "contact" on steelTOOLS. **The first 10 people who add Tabitha as a friend and send her a message on steelTOOLS mentioning this article will receive \$10 gift cards to Best Buy to assist you in expanding your technological "tools" for social networking at home or work!***

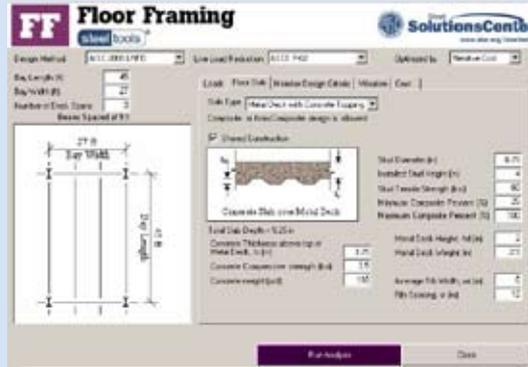


A Few Samples from steelTOOLS

Many helpful tools are already available on www.steeltools.org. Some of our favorites currently on the site include:

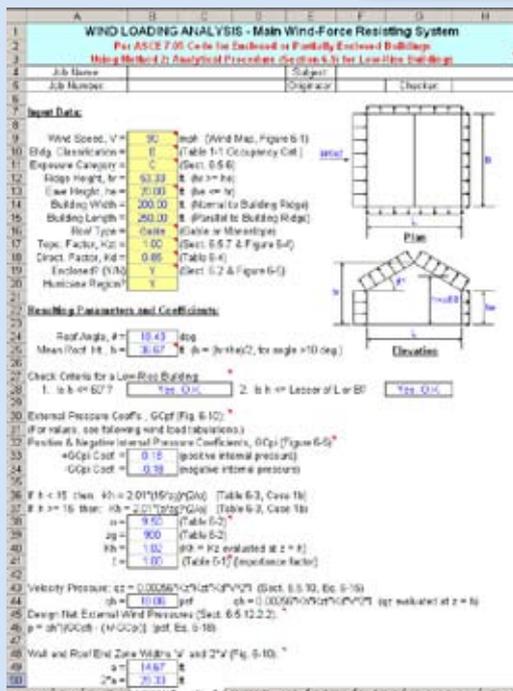
1. Floor Framing (posted by Steel Solutions Center)

Floor Framing was written and released a few years ago by the AISC Steel Solutions Center. Floor Framing can help engineers optimize preliminary interior bay steel floor framing designs, based on either the overall weight or the relative cost of the framing system. Each evaluation is based on strength, deflection limits, and vibration criteria for walking excitation based on AISC Design Guide 11, *Floor Vibrations Due to Human Activity*. Each run takes less than a minute, so inputs such as slab density and thickness, beam spacing, and loading can quickly be changed to optimize the floor framing.



2. Clean Columns (posted by Steel Solutions Center)

With Clean Columns, users can quickly find the minimum weight column section that can be used without stiffeners and/or doubler plates to develop a specified moment. This tool is based on the criteria presented in AISC Design Guide 13, *Stiffening of Wide-Flange Columns at Moment Connections*, and applies in wind or low-seismic applications. After the user inputs the connection forces, this tool takes only a few minutes to identify the lightest unreinforced structural steel column section.



3. ASCE 7-05W

(posted by Alex Tomanovich)

This spreadsheet program can be used to determine wind loads for buildings and structures per the ASCE 7-05W standard. Specifically, wind pressure coefficients and related and required parameters are selected or calculated in order to compute the net design wind pressures.

ing the early stages of a project. Steel Tools quickly became very popular among the design community.

AISC also recognized that designers have their own personal sets of similar design shortcut tools, and the concept of file-sharing these tools took flight. Natural questions arose, including: *Why shouldn't engineers collaborate to avoid the reinvention of the wheel? Why not share Steel Tools with our peers and constituents as open source files so others can personalize and improve them?*

The future path became clear. With today's online social networking technology, we have the capability of easily sharing these tools with each other as a community, more tools than could ever be developed or maintained internally at AISC. This sharing will only help to grow and develop the expertise and quality of our profession and industry.

Recently, online "social networking" has begun infiltrating segments of most of our personal and professional circles. Whether you enjoy reading or contributing to blogs or connecting with old friends and colleagues, there are a multitude of social networking sites available, and some geared toward your specific interests. Today two-thirds of the entire Internet-using population is part of an online social community. Facebook is the fourth largest website in the world. In terms of minutes spent on the site, Facebook grew by more than 500% in the last year alone. Other social networking leaders in web traffic include MySpace, LinkedIn, Twitter, CafeMom, Classmates, and Flixster, to name just a few. Interacting socially in a virtual world is evolving into a mainstay of what we do and who we are. And a demographic shift is occurring—studies show that social networking is no longer "just for kids."

To serve and assist its constituency in this regard, AISC is proud to announce the official launch of www.steeltools.org, its new "one-stop shop" for the design and construction community.

While the name is familiar, the new steelTOOLS online community offers many useful features, including:

- The full set of previously released AISC Steel Tools—in an open-access file format that enables users to download, update, and modify the tools as they see fit.
- A file-sharing platform for all members of the design and construction industry

to download or post files, vote, and comment on others' design tools and software utilities. One such user-provided tool, ASCE 7-05W from site contributor/steelTOOLS member Alex Tomanovich, is shown elsewhere in this article.

- A free, full-service social/professional networking environment that includes the ability to connect with others, read current hot topics, and set up blogs about issues that interest you.

It's easy to create a free steeltools.org profile and network with other users on the site. The site is open to all members of the construction industry, and any construction-related tools, files, and topics are welcome.

Why should you join and participate?

- Get free access to valuable utilities created by the AISC Steel Solutions Center.
- Contribute your files and tools to share with others.
- Download and comment on other users' tools.
- Read and blog about topics related to design and construction.
- Connect with others on common specific interests.
- Find great free software and tools from various software companies.

The question then becomes: Why *wouldn't* you join?

The website will host many ongoing programs and contests to highlight frequent contributors and to reward those who post especially valuable tools on the site. Online communities with common interests such as "Detailing" and "Sustainability...and Going Green!" have already formed with a number of associated followers and interesting blogs. And, if you already are a registered user of the AISC website, joining the steelTOOLS community is especially easy—you can login with the same user name and password.

We at the Steel Solutions Center see this as a great avenue to learn more about the designers, specifiers, and detailers in our industry. This much-needed platform enables us all to share knowledge in an open and collaborative environment, continually increasing the quality and productivity of the steel and construction industry. We at AISC look forward to reading your blogs, downloading your files, and networking with you. **MSC**