

NASCC Offers LRFD Tutorial In Las Vegas

If you never learned LRFD in school, or if you need a refresher course, this year's North American Steel Construction Conference will include a 10-hour tutorial. The LRFD program is offered in addition to the Conference's traditional technical sessions and trade show.

Scheduled for February 23-26, 2000 in Las Vegas and sponsored by the American, Canadian and Mexican Institutes of Steel Construction, the conference is a once-a-year opportunity for designers, fabricators, detailers and erectors to come together for

practical sessions designed to provide information useful in their day-to-day business.

Highlighting this year's NASCC is the LRFD Tutorial, which is designed to provide the practical knowledge to start using LRFD in your design office. If your company is considering transitioning from ASD to LRFD, this course will give you the tools to succeed. Or if you need to short-circuit the learning curve, this course is the ideal vehicle for you. Faculty for the Tutorial are Louis F. Geschwindner, Ph.D., P.E., Professor of Architectural Engineering



at Penn State University and Kurt Swensson, P.E., S.E., of KSi Structural Engineers in Atlanta.

Engineers who attend this tutorial will also have a jump start on the scheduled release of the Third Edition LRFD Manual of Steel Construction in the fourth quarter of 2000.

The tutorial will be presented in seven, 1-1/2 hour sessions with each session including time for working out problems under the guidance of the course faculty. There is no additional fee above the conference registration for attending the LRFD Tutorial. Also, while sessions will build on the material covered in previous sessions, you have the option of only attending specific portions of the tutorial as your schedule permits.

PLENARY SESSION: VIVA LAS VEGAS

This year's plenary session will feature an in-depth look at some of the incredible structural engineering accomplishments in recent Las Vegas construction, including:

- the Eiffel Tower II (a half-scale model of the original);
- the Hilton Hotel Sign (towering more than 350');
- the Star Trek center at the Hilton Hotel (a 90,000-sq.-ft. entertainment center that includes the suspension of a starship model);
- the Manhattan Express (a large roller coaster supported on a 1,000-ton platform above a casino);
- and the MGM Grand Lion (a 45' high steel-framed sculpture).

Project Management For Fabricators & Other Short Courses

Efficient and effective project management can save both time and money. NASCC 2000 offers a four-hour short course that explores the latest methods and tools for project management, as well as examining a case-study of one contractor's successful implementation of new project management techniques. These techniques are credited with a material and labor savings of nearly 30%! Attendees at this pre-conference course will learn:

- State-of-the-art tools and techniques for planning and scheduling;
- How to make a reliable project schedule; and
- How to plan and manage the schedule.

Faculty for the short course, which costs \$80 (\$100 for non-AISC members), includes: Martin Fischer from Stanford University; Glenn Ballard from the Lean Construction Institute; and Todd Zabelle of Pacific Contracting.

Other short courses include:

- **Floor Vibrations.** Today's more efficient floor systems require designers to carefully consider vibration concerns. This popular session will include information on acceptance criteria for human comfort; design for walking excitation; evaluation and solutions of vibration problems; and design for sensitive equipment. The cost for this four-hour session is \$80 (\$100 for non-AISC members).
- **Lateral Framing Systems.** Does your firm design structures in low seismic regions? Do you find it time consuming and confusing to sort through all the new seismic information and code provisions? If so, this course is a must for you. The course focuses on the 2000 International Building Code, which will incorporate ASCE 7-95, the 1997 NEHRP Provisions and the 1997 AISC Seismic Provisions. These documents are forming a consistent design basis for updated building codes that are in the process of being implemented nationally.

You'll learn about structural steel lateral-load-resisting systems for wind and low-seismic applications. We'll emphasize what you need to know to select the most design-efficient, cost-effective moment frame systems and braced frame systems for your projects. A variety of connection designs and detailing options will also be illustrated to help you select and implement the best option for each specific situation more quickly and more easily.

The cost for the five-hour course is \$135 (\$180 for non-AISC members).

MORE THAN 30 SEMINARS

From connection design to a discussion of welding design by Omer Blodgett, the conference features a wide variety of courses for engineers, fabricators, erectors and detailers.

While the program divides the seminars into "tracks", all of the sessions are open to all attendees and engineers and encouraged to attend fabrication sessions, fabricators are invited to attend erection programs, etc.

Sessions include:

- Connection Research Results
- Steel Deck Topics
- Q&A: Steel Interchange Live
- Evaluating Fire Damage
- Welding Lessons Learned
- Materials Issues
- Rules of Thumb for Steel Design
- AISC Specifications
- Steel Joist Topics
- Industrial Building Design
- Seismic Design of Concentrically Braced Frames
- Connection Software
- Design Build Issues
- Seismic Response of Slender High-Rise Buildings
- Changes in the Code of Standard Practice
- Electronic Data Interchange
- Changes in Subcontract Forms
- Robotic Welding
- Revised Sophisticated Paint Endorsement
- Taking Your Weld's Temperature
- E-Steel: Using the World Wide Web to Improve Your Business
- Detailing for Steel Construction
- Advances in Detailer Training
- Detailer Programs for Today and the Future
- Guidelines for Successful Steel Construction: The Detailer's Point of View
- Composites in Bridge Construction and Renovation
- AISC Erector Certification Program
- Welding Issues in the Rehabilitation of Existing Structures
- Cases Studies in High-Strength Bolt-ing for Steel Erectors
- Behavioral-Based Processes for Erectors
- Erection Issues at the new San Francisco International Airport Terminal

The plenary sessions, as well as seven of the technical sessions, will also be translated in Spanish.

EXTENSIVE TRADE SHOW

In addition to the educational ses-

sions, the conference features an extensive trade show offering a look at the latest products for steel designers and contractors.

Recent exhibitors have included engineering and fabrication/detailing software vendors, bolt manufacturers, welding suppliers, fabrication equipment manufacturers, paint and galvanizing vendors and safety product suppliers.

To receive more information on the 2000 North American Steel Construction Conference, fax 312/670-5403 or consult the AISC website at www.aisc.org.

Bracing Seminar Features Yura And Helwig

A new series of Bracing Short Courses, featuring Joseph A. Yura from the University of Texas at Austin and Todd Helwig from the University of Houston, is about to get underway. The two-day, eight-hour course, including an 80-page handout, costs \$200 (\$175 for AISC/RCSC members). Covered are present principles, case studies and recommendations. The lectures include: column & frame bracing; lean-on systems; torsional bracing; beam buckling; lateral bracing of beams; and torsional bracing of beams.

Jointly sponsored by AISC and the Structural Stability Research Council, the seminar is a repeat of the standing-room only short course at the 1995 NSCC Conference. For more information, fax 312/670-5403 or register by calling 630/369-7784.

Bracing Course Schedule

1999

Dec. 6-7Atlanta

2000

Jan. 11-12Pittsburgh

Jan. 13-14Denver

To receive more information on the Bracing Short Course, please fax 312/670-5403 or consult the AISC web site at www.aisc.org.

LRFD Spec. Review

The 1999 AISC Load & Resistance Factor Design Specification for Structural Steel Buildings is now available for public review. If you are interested in reviewing it and submitting comments, please send a check for \$15.00 made out to AISC to cover shipping and handling, to Janet Tuegel, AISC, One East Wacker Dr., Suite 3100, Chicago, IL 60601. A photocopy of the Draft version of the Specification and Commentary will be mailed to you. Comments will be accepted until November 30, 1999.

Steel Sculpture Provides Tangible Instruction

Duane Ellifritt, former engineering professor at the University of Florida-Gainesville, was honored last month with an AISC Special Achievement Award for the design on a steel teaching sculpture that permanently sits on the university's campus. The award was part of a rededication ceremony for the sculpture which has inspired more than 80 additional sculptures on campuses throughout the country and in Canada.



Ellifritt initially came up with the idea when he realized there was no three-dimensional way of teaching students about connections. Realizing that if a picture was worth a thousand words, then an actual physical representation would be even more valuable, Ellifritt designed the sculpture, which was erected in 1986, so that connections would become more real for the students. "My eventual solution was to create a steel sculpture that would be an attractive addition to the public art already existing on campus, something that would symbolize engineering in general, and that could also function as a teaching aid," Ellifritt writes in the AISC booklet, "Connecting Steel Members: A Teaching Guide."

H. Louis Gurthet, President of AISC, praised the educational value of the sculpture, stating that "most complications arise from connections." Gurthet went on to say that Ellifritt's sculpture has rejuvenated an interest in the field of engineering education. Ellifritt remarked, "I wish I had known 13 years ago that this would be so popular. I would have gotten a copyright and collected some royalties on it."

Other speakers at the dedication ceremony included Dr. M.J. Ohanian, interim dean, College of Engineering at U of FL; Fromy Rosenberg, P.E., assistant director of education at AISC; Dean Fritz, President of Fritz Structural Steel, Inc. (AISC member); Kathy Caldwell, President of the Florida section of ASCE; and Dr. Paul Y. Thompson, Chairman, Department of Civil Engineering and Coastal and Oceanographic Engineering, Interim Associate Dean for Research and Administration.

CONSTRUCTION METRICATION: STRUCTURAL STEEL

(The following information is reprinted from Construction Metrification, the newsletter of the Construction Metrification Council of the National Institute of Building Sciences, 1090 Vermont Ave., N.W., Suite 700, Washington, DC 20005-4905; ph: 202/289-7800; email: bbrenner@nibs.org; web site: www.nibs.org)

Metric versions of most structural steel products are no different in size than their inch-pound equivalents. Rather, the inch-pound materials are simply re-labeled ("soft converted") in metric units. Because few steel products are produced in even, round inch-pound sizes now, there is no need to convert them to even, round metric sizes.

Types of Steel. The common ASTM specifications for structural steel products (A992/A992M, A36/A36M, A572/A572M, A529/A529M, A242/242M, A588/A588M, A852/A852M, and A514/514M) include both inch-pound and metric units. Where multiple grades exist within a specification, the metric yield stress is used. For example, A572 Grade 50 (50 ksi) steel becomes ASTM A572/A572M Grade 345 (345 MPa). The table below shows the equivalence of several common metric yield stresses to their inch-pound cousins.

Yield Stress (MPa)	Approximate Yield Stress (ksi)
250	36
290	42
345	50
415	60
450	65

Linear Dimensions. Linear dimensions are converted to millimeters (mm) and mass is converted to kilograms (kg). Yield and tensile stresses are expressed in megapascals (MPa), where 1 MPa = 1 N/mm² and 1 ksi = 6.895 MPa. Note that mass must be multiplied by the acceleration of gravi-

ty, 9.81 m/s², to determine force in newtons (N).

Structural Shapes (Series W, M, S, HP, C, and MC). The metric nomenclature for hot-rolled structural shapes is defined in ASTM A6/A6M. In general, structural shapes are soft converted with actual dimensions rounded to the nearest millimeter. Depending on the shape, masses are rounded to the nearest kilogram per meter or tenth of a kilogram per meter. The nominal depth of each shape, however, is always rounded to the nearest 10 mm. For example, a W14x90 shape is expressed in metric units as W360x134. The nominal depth of 14 inches is converted to a nominal 360 mm and the mass of 90 lb/ft is converted to 134 kg/m.

Some U.S. mills have implemented a dual unit marking system whereby each piece is marked with both inch-pound and metric designations regardless of the type of order. No mill has established stock metric lengths, however. Consult each mill to determine length, cutting, and shipping practices.

Angles. Angles are soft converted as designated in ASTM A6/A6M. Leg sizes are rounded to the nearest millimeter and thicknesses are rounded to the nearest tenth of a millimeter.

Hollow Structural Sections (HSS). HSS are soft converted. For rectangular or square HSS, side dimensions and wall thicknesses are converted and rounded to the nearest tenth of a millimeter. For example, an HSS6x6x1/4 would be designated an HSS 152.4x152.4x6.4. For round HSS, the diameter and wall thickness are converted and rounded to the nearest tenth of a millimeter.

Steel Pipe. Pipe is soft converted with new designations based on ISO DN (diameter nominal) sizes where 1 inch = 25 mm (see the September-October 1993 issue of Metric in Construction). Existing pipe

strength identifiers remain unchanged. Thus, a 6-inch standard pipe will be relabeled as DN150 pipe, a 6-inch extra-strong pipe as DNX150 pipe, and a 6-inch double-extra-strong pipe as DNXX150 pipe. Alternatively, the DN size may be used with the identifiers "standard," "extra strong," and "double-extra-strong." A foolproof identification includes the DN size, the wall thickness in millimeters and the mass in kilograms per meter. Most standard pipe sizes are also available as round HSS shapes, manufactured from typical HSS steels.

Bar and Plate Products. Since plates can be rolled to any thickness and width by simply adjusting the plate rolls, most mills have the capability to produce metric thicknesses should an order be large enough to warrant it. Locating small quantities of bar in metric thicknesses, however, may be difficult for some time.

When a project calls for metric bar material, reasonable solutions may be to: (1) order a plate product of the required metric thickness and flame-cut or shear the plate to the required width (plate nesting will minimize scrap loss); (2) order bars to the closest available inch-pound thickness and width; or (3) use soft-converted metric bar dimensions.

High-Strength Bolts, Nuts, and Washers. The metric series of high-strength bolts, nuts, and washers is a true ("hard") metric series designated by an "M" prefix followed by the actual diameter in millimeters: M16, M20, M22, M24, M27, M30, and M36. See ASTM specifications A325M and A490M for high-strength bolts, A563M for nuts, and F436M for washers. The next LRFD Specification for Structural Joints Using ASTM A325 or A490 Bolts, which is currently under development by the Research Council on Structural Connections, is planned to be a dual-units specification.

Welding. AWS nomenclature for metric electrodes uses the first two digits of the strength of the electrode. For

Metric, Continued

example, an electrode with a 480 MPa strength level (70 ksi) would be designated as an E48 electrode. The inch-pound strength equivalents of common metric electrode strengths are presented in the following table.

Electrode	Strength in MPa	Approx. Strength in KSI
E43	430	60
E48	480	70
E55	550	80
E62	620	90
E69	690	100

AISC Metric Publications and Software. The following metric publications are available from AISC:

- Metric LRFD Specification for Structural Steel Buildings (AISC, 1994), \$20.
- Metric LRFD Specification Supplement No. 1 (AISC, 1998), no charge.
- LRFD Manual of Steel Construction, Metric Conversion of the 2nd Edition (AISC, 1999), Volumes I and II, \$132 for the set or \$72 each.
- Fundamentals of (Metric) Structural Shop Drafting (Canadian Institute of Steel Construction, 1988), \$35.

The following utility software for structural steel shapes is available from AISC:

- AISC Database, v. 2.0, Metric Units, an ASCII data file that gives programmers electronic access to the metric designations, dimensions, and properties for structural shapes – W, M, S, HP, C, MC, WT, MT, ST, L, LL, HSS, P, PX, PXX, \$60.

To order AISC publications, call 800-644-2400. To order software, call 312-670-2400. Publications and software can also be ordered from AISC's web site, www.aisc.org.

Wide Flange Availability

During the past quarter there has been an increasing concern among fabricators and others involved in the design and construction of steel buildings about the ready availability of certain wide flange sections. AISC has been active in requesting information from the major producers of wide flange about this situation. The following is a letter from TXI Chaparral Steel to H. Louis Gurthet, President, AISC, dated October 18, 1999 and reprinted here with TXI Chaparral's permission as a courtesy to MSC's readers:

Dear Lou:

Thank you for your recent questions regarding availability of wide flange beams in the market place. TXI Chaparral Steel is working hard to provide our customers with the beams they need, when they need them. For this reason, we have invested \$500,000,000 in a new mill in Virginia. We also understand the importance of timely schedules and fulfilling orders, and are exercising every option available to us to meet these needs.

Over the past few weeks, we have experienced strong bookings in a few of the more popular wide flange beam families as the market adjusts to the impact of trade case filings. Just this week, changes have been made in our operations to increase our Texas production or both the Medium Section Mill and the Large Section Mill by approximately 40,000 tons by the end of this year. The additional production will be concentrated in the most demanded sizes.

We also are currently producing beams at our facility in Virginia. The start-up in Virginia has been our most efficient start-up yet. Although we are currently booking on a "no harm, no foul" basis, we expect that this practice will be lifted soon. Also, to meet market demand, we will shift our focus from commissioning new beam sizes to maximizing production output. As a result, by January 2000 we anticipate producing at a 40,000-ton rate per month and by June 2000 at a 60,000-ton rate per month. Our increased output will also be concentrated on the popular sizes.

At the SSCI Forecast 2000 Conference last month, I presented TXI's forecast for next year. Specifically, I stated the next few months would provide a few challenges for specific sizes in our product range. We expect this issue to be size specific and temporary. To address the issue, we are taking steps to increase production at our Texas and Virginia facilities, which should dramatically, increase supply by early 2000.

Please contact me if you have any further questions about these issues, or other questions regarding our progress with the Virginia start-up. You may also check our web site at www.chaparral-steel.com/structural regarding Virginia updates.

Regards,

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